California Environmental Protection Agency

Air Resources Board

State of California
California Environmental Protection Agency
AIR RESOURCES BOARD

Final Report on Pesticide Air Monitoring Near Application of Chlorthal-Dimethyl In Monterey County, April 2011

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Monitoring Report Approval

Report Title: Final Report on Pesticide Air Monitoring Near Application Chlorthal-Dimethyl in Monterey County, April 2011

Project Lead: Steve Aston, Air Resource Engineer

Approval: The following monitoring report has been reviewed and approved by the Monitoring and Laboratory Division.

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Executive Summary

At the request of the Department of Pesticide Regulation (DPR), the Air Resources Board (ARB) conducted ambient air monitoring adjacent to an application of the pesticide chlorthal-dimethyl in Monterey County during April 2011. The chlorthal-dimethyl is applied directly to broccoli fields by ground application spraying and is used as an herbicide to control a wide range of grasses and broad-leaved weeds.

Fifty three field samples, including four (4) field spikes, four (4) trip spikes and nine (9) background samples were collected from eight different locations around the perimeter of an 8.8 acre broccoli field located in Monterey County. The chlorthal-dimethyl was applied by ground spraying using a tractor at a rate was 4.38 lbs. of chlorthal-dimethyl per acre.

Samples were collected by passing 3.0 liters per minute (LPM) of ambient air through XAD-2 sorbent tubes positioned 1.5 meters above ground level.

There were a total of five (5) ambient sampling periods per DPR's request (including a background). At the end of each sampling period, the XAD tubes were placed in containers with an affixed identification label and transported on dry ice to the ARB Sacramento Monitoring and Laboratory Division (MLD) laboratory for analysis. The samples were then stored in a freezer until analyzed. Samples were analyzed using gas chromatography with an electron capture detector.

DPR requested a maximum estimated quantitation limit (EQL) of 0.1 micrograms per cubic meter (µg/m³). The 0.1 µg/m³ was achieved by the ARB's laboratory based on a 24-hour collection with a sample flow rate of 3.0 LPM.

- The reported results of chlorthal-dimethyl range from <0.020 to 0.298 µg/m³.

- The highest values reported were collected during the third and fourth post application sampling periods. The field sampling sites were downwind sites located 20 meters from the south, southeast, and east edges of the field.

- The field spike recoveries ranged from 84 to 133% and trip spikes ranged from 77 to 86%.

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1.0 Introduction

At the request of the California Department of Pesticide Regulation (DPR) (2011 Memorandum, Reardon to Goldstene, Appendix A), Air Resources Board (ARB) staff conducted sampling of airborne concentrations of chlorthal-dimethyl during an application in Monterey County.

Fifty three field samples, including four (4) field spikes and four (4) trip spikes were collected from eight (8) different locations around the perimeter of an 8.8 acre broccoli field from April 12 through April 15, 2011. The chlorthal-dimethyl (Dacthal Flowable Herbicide) was applied by ground spraying using a tractor on April 13 from approximately 09:15 to 11:21 AM PST calculating to a 126 minute application period. The pesticide application was paused for about an hour while field workers staked off a portion of the field. See figure 1

The chlorthal-dimethyl application rate of 4.38 lbs. /acre was calculated using the farmer's seed ticket and manufacture's listed product label specification sheet. The information from the seed ticket showed that 822.0 fluid ounces of chlorthal-dimethyl was applied to an 8.8 acre field. The equations used to calculate the amount applied per acre is listed on page 16.

Refer to the next page Table 1 and Table 2 for Application Information and Application Sampling periods.

The pesticide monitoring was performed under the requirements of Food and Agricultural Code, Division 7, Chapter 3, Article 1.5 which requires the ARB, "…to document the level of airborne emissions…of pesticides that may be determined to pose a present or potential hazard…", when requested by the DPR.

Figure 1
Field Workers Staking Off Field

Parameter	Details
Location	Monterey County, CA. South of Salinas, west of Highway 101
Field Size	8.8 acres
Product Applied	54.9% Dacthal Flowable DCPA (dimethyl tetrachloroterephthalate) 45.1% inert ingredients (Contains 6lbs. chlorthal-dimethyl (DCPA) per gallon of Dacthal Flowable product)
Application Type	Ground air-blast (tractor pulled sprayer) Start = 0915 to 1121 PST
Commodity	Broccoli
Application Rate	0.73 gallons of Dacthal Flowable product per acre at a calculated 4.38 lbs./acre of chlorthal-dimethyl

Table 1
Application Information

Sampling Period	Sample Period Duration (Hours)	April 2011 (Date)	Time (Start/Stop)
Background	16.6	12-13	1454 to 0838
1 (Application)	10.6	13	0851 to 1914
2 (Nighttime)	13.5	13-14	1816 to 0843
3 (Daytime)	10.7	14	0735 to 1911
4 (Nighttime)	14.0	14-15	1812 to 0905
Note: Exact duration for each sample is listed in APPENDIX D XAD2 Sample Field Log Sheets.			

Table 2
Application Sampling Periods

2.0 Sampling Sites

Figure 2 (Satellite Map of Overview of Monitoring Area) and Figure 3 (Satellite Photo of Chlorthal-Dimethyl Sampling Sites) presents a Google map-view of the area surrounding the application field located in Monterey County and the locations of each sampler during the background, application and post-application sampling periods and the location of the Met One auto-met weather station.

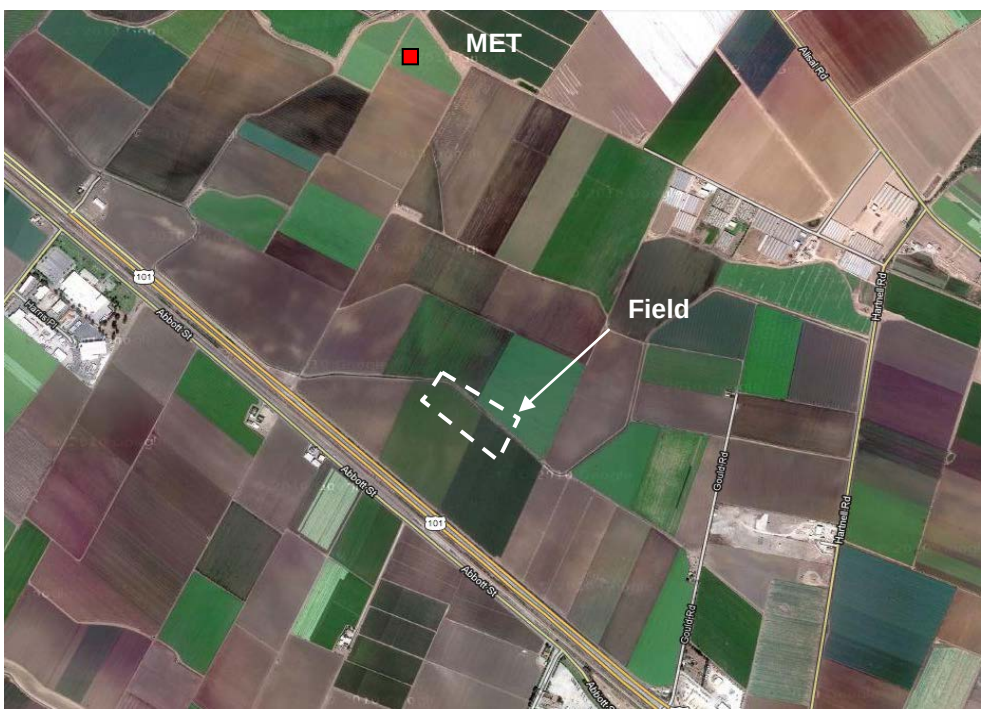


Figure 2
Satellite Map of Overview of Monitoring Area

Eight (8) samplers and one (1) co-located sampler were located approximately 20 meters from the edges of the treated field's corners and were positioned midway down the length and width of the 8.8 acre broccoli field. See Appendix B for individual site photographs.

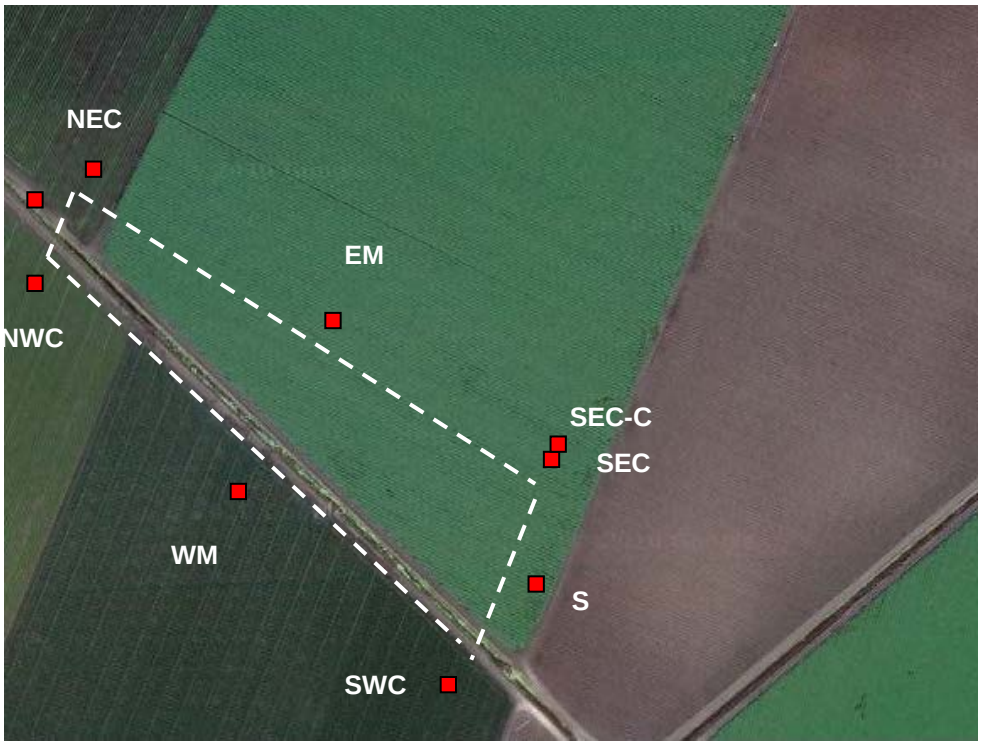


Figure 3
Satellite Map of Chlorthal-Dimethyl Sampling Sites

During the background period the prevailing winds were coming out of the northwest, so the southeast corner of the field was chosen as the downwind site for quality control samples.

Table 3 below lists the sampler locations and coordinates.

Sampler ID	Sample Position Related to Monitored Field	Waypoints
MET (Meteorology Station)	~1/4 mile East of field	East of Field
NEC (Northeast Corner)	66' East of the Northeast Corner of the field, Elevation = 13'	N 36˚38'21.6 W 121˚35'40.8
N (North Side)	66' North of the field and 100' from the Northeast Corner, Elevation = 13'	N 36˚38'20.1 W 121˚35'41.7
NWC (Northwest Corner)	66' West of the Northwest Corner of the field and 100' from North Side, Elevation = 14'	N 36˚38'19.0 W 121˚35'42.1
WM (West Middle)	66' West of the field and 543.5' from the Northwest Corner of the field, Elevation = 13'	N 36˚38'15.3 W 121˚35'37.3
SWC (Southwest Corner)	66' West of the Southwest Corner and 543.5' from the West Middle of the field, Elevation = 13'	N 36˚38'11.7 W 121˚35'32.5
S (South Side)	66' South of the field and 257' from the Southwest Corner of the field, Elevation = 13'	N 36˚38'14.1 W 121˚35'31.1
SEC (Southeast Corner)	66' East of the Southeast Corner of the field, 257' from the South Side of the field, Elevation = 13	N 36˚38'17.0 W 121˚35'29.7
EM (East Middle)	66' East of the field and 493' from the Southeast Corner of the field, Elevation = 10	N 36˚38'18.5 W 121˚35'35.6

Table 3
Sample Waypoints

3.0 Methods

Samples were collected by passing 3.0 liters per minute (LPM) of ambient air through XAD-2 sorbent tubes, 1.5 meters above the ground level as shown in (Figure 4), Ambient Air Sampler. There were a total of five (5) ambient sampling periods including a background as requested by DPR. Air samples were taken before, during, and after the chlorthal-dimethyl application. There were three (3) daytime and two (2) overnight sampling periods.

The background sampling started on April 12, 2011 at 14:54 (PST) and ran till the morning of April 13, 2011, 08:38 (PST).

The chlorthal-dimethyl application started at 9:15 (PST) on April 13, 2011 and ended at 11:21 (PST). The post-application samples started one (1) hour before sunset and

were collected one (1) hour before sunrise and reloaded with XAD-2 sorbent tubes for the daytime sampling.
At the end of each sampling period, the XAD-2 sorbent tubes were placed in containers with an affixed identification label. The exposed sample XAD-sorbent tubes were transported on dry ice, as soon as possible, to the ARB Sacramento Monitoring and Laboratory Division (MLD) laboratory for analysis. The samples were then stored in a freezer until analyzed.

Figure 4
Ambient Air Sampler

An AALBORG certified mass flow meter was used to measure and adjust sample flow rates. The flow rates were set to 3.0 LPM, as measured using a digital mass flow meter (MFM) scaled from 0-5 LPM before the start and end of each sampling period. Samplers were leak checked prior to each sampling period with the sampling tubes installed. Any change in the flow rates were recorded in the field logbook. The field logbook was also used to record start and stop times, start and stop flow rates, start and stop time counter readings, sample identifications and any other significant information.

In addition to ambient air samples, quality control samples consisted of collocated samples, field spikes, and trip spikes.

Meteorological data was collected using a portable Met One auto-met weather station which logged 5 minute averages for wind speed and direction along with temperature

and relative humidity. See Figure 6, 7, 8, 9 for Wind Roses and APPENDIX G for meteorological data.
For details of the monitoring method, please refer to Appendix C, "Sampling Protocol for Chlorthal-Dimethyl (Dacthal) Application Study" (dated March 22, 2011). There were no significant deviations from this protocol.

Collected samples were analyzed by the Special Analysis Laboratory Section of MLD's Northern Laboratory Branch using a gas chromatography analyzer with an electron capture detector.

The estimated quantitation level (EQL) for this method is 0.1 µg/m³ prior to any sample dilution for sampling at three (3) LPM and a three (3) milliliter (ml) extraction.

Per the laboratory's report (APPENDIX D) the minimum detection limit (MDL) calculation follows the United States Environmental Protection Agency (USEPA) procedures for calculating MDL's. Using the analysis of seven low-level matrix spikes (0.1 µg/ml), the MDL and EQL for a three-ml extract is calculated as follows:

s = the standard deviation of the concentration calculated for the seven replicate spikes.
For chlorthal: s = 0.006 µg/ml
MDL = (3.14) x (s) = (3.14) x (0.006) = 0.018 µg/ml.
MDL for total µg/sample = 0.06 µg/sample
EQL = (5) x (MDL) = (5) x (0.018) = 0.090 µg/ml
EQL for total µg/sample = 0.270 µg/sample

Based on a total collection volume of 4.32 m^3 the EQL would be 0.1 $\mu g/m^3$. Staff reported results above the EQL to two significant figures. Results below the EQL but greater than or equal to the MDL are reported to one significant figure. Results less than MDL are reported as the calculated MDL to one significant figure. See Appendix D

4.0 Results

The results indicated low levels of chlorthal-dimethyl ranging from <0.020 to 0.298 µg/m³. The highest levels were detected in the field samples during the third and fourth post application sampling periods at downwind sampling locations 20 meters from the south, southeast, and east edges of the field.

The results are located in Table 4 and are reported by sample location, elapsed time in minutes and hours, average flow in LPM, calculated total volume m³. These values were used to calculate the reported lab results µg/sample to µg/m³ for each sampling location.

Wind roses are located in Figure 5 thru 9 showing the wind characteristics for each of the five (5) sampling periods including the background. The meteorological data was captured using five (5) minute averaging. (See APPENDIX G Meteorological Data)

The following abbreviation scheme is used to identify individual samples and sampling events.

Site/Sample Identification

Ambient Site Naming:

NEC 1-4	Northeast Corner of Field
N 1-4	North Side of Field
NWC 1-4	Northwest Corner of Field
WM 1-4	West Middle of Field
SWC 1-4	Southwest Corner of Field
S 1-4	South Side of Field
SEC 1-4	Southeast Corner of Field
SEC 1C-4C	Southeast Corner of Field Co-located
EM 1-4	East Middle Side of Field

See Figure 2, Satellite Map of Chlorthal-Dimethyl Sampling Sites

Letter Abbreviations as follows: FS = Field Spike, CO= Co-located

Log #	Sample Location	Elapsed Time (Minutes)	Elapsed Time (Hours)	Avg. Flow (LPM)	Total Volume (m^3)	Chlorthal (µg/sample)	Chlorthal (µg/m^3)
P001	BKG-NEC	996.0	16.6	3.02	3.01	<0.06	<0.020
P010	NEC-1	564.0	9.4	2.99	1.69	<0.06	<0.036
P020	NEC-2	798.0	13.3	2.91	2.32	<0.06	<0.026
P030	NEC-3	636.0	10.6	3.05	1.94	<0.06	<0.031
P040	NEC-4	828.0	13.8	3.01	2.49	<0.06	<0.024
P002	BKG-N	984.0	16.4	3.04	2.99	<0.06	<0.020
P011	N-1	576.0	9.6	2.99	1.72	<0.06	<0.035
P021	N-2	798.0	13.3	2.94	2.35	<0.06	<0.026
P031	N-3	642.0	10.7	3.07	1.97	<0.06	<0.030
P041	N-4	822.0	13.7	3.00	2.47	<0.06	<0.024
P003	BKG-NWC	960.0	16.0	1.81	1.74	<0.06	<0.035
P012	NWC-1	588.0	9.8	2.98	1.75	<0.06	<0.034
P022	NWC-2	798.0	13.3	3.03	2.42	<0.06	<0.025
P032	NWC-3	636.0	10.6	2.93	1.86	<0.06	<0.032
P042	NWC-4	840.0	14.0	3.00	2.52	<0.06	<0.024
P004	BKG-WM	978.0	16.3	3.02	2.95	<0.06	<0.020
P013	WM-1	588.0	9.8	2.98	1.75	<0.06	<0.034
P023	WM-2	804.0	13.4	2.92	2.35	<0.06	<0.026
P033	WM-3	630.0	10.5	3.03	1.91	<0.06	<0.031
P043	WM-4	834.0	13.9	3.01	2.51	0.06	0.024
P005	BKG-SWC	978.0	16.3	3.00	2.93	<0.06	<0.020
P014	SWC-1	594.0	9.9	2.99	1.78	<0.06	<0.034
P024	SWC-2	804.0	13.4	2.95	2.37	<0.06	<0.025
P034	SWC-3	630.0	10.5	2.99	1.88	<0.06	<0.032
P044	SWC-4	834.0	13.9	2.99	2.49	0.07	0.028
P006	BKG-S	966.0	16.1	3.07	2.97	<0.06	<0.020
P015	S-1	624.0	10.4	3.00	1.87	<0.06	<0.032
P025	S-2	804.0	13.4	2.94	2.36	<0.06	<0.025
P035	**S-3**	**630.0**	**10.5**	**3.02**	**1.90**	**0.567**	**0.298**
P045	S-4	840.0	14.0	2.99	2.51	0.16	0.064

Note: Bold µg/m^3 values are greater than EQL 0.1 µg/m^3

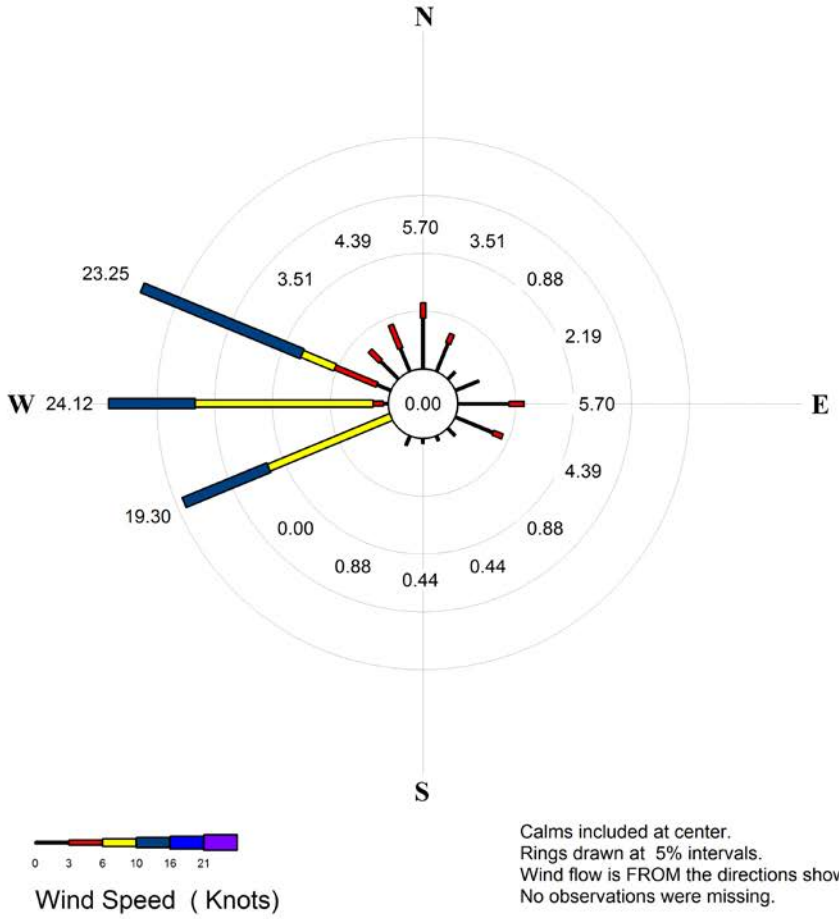
Table 4
Application Results by Site

Log #	Sample Location	Elapsed Time (Minutes)	Elapsed Time (Hours)	Avg. Flow (LPM)	Total Volume (m^3)	Chlorthal (µg/sample)	Chlorthal (µg/m^3)
P007	BKG-SEC	960.0	16.0	3.04	2.92	<0.06	<0.021
P008	BKG-C-SEC	972.0	16.2	3.11	3.02	<0.06	<0.020
P016	SEC-1	624.0	10.4	2.98	1.86	<0.06	<0.032
P017	SEC-C-1	624.0	10.4	3.00	1.87	<0.06	<0.032
P026	SEC-2	810.0	13.5	2.92	2.37	<0.06	<0.025
P027	SEC-C-2	810.0	13.5	2.88	2.33	<0.06	<0.026
P036	**SEC-3**	**624.0**	**10.4**	**2.81**	**1.75**	**0.444**	**0.253**
P037	**SEC-C-3**	**630.0**	**10.5**	**3.09**	**1.95**	**0.543**	**0.279**
P046	SEC-4	840.0	14.0	2.95	2.48	<0.13	<0.052
P047	SEC-C-4	834.0	13.9	2.99	2.49	<0.12	<0.048
P009	BKG-EM	960.0	16.0	3.07	2.95	<0.06	<0.020
P019	EM-1	636.0	10.6	2.89	1.84	<0.06	<0.033
P029	EM-2	810.0	13.5	2.89	2.34	<0.06	<0.026
P039	**EM-3**	**630.0**	**10.5**	**2.97**	**1.87**	**0.42**	**0.224**
P049	EM-4	828.0	13.8	2.93	2.43	0.12	0.049

Note: Bold µg/m^3 values are greater than EQL 0.1 µg/m^3

Table 4
Application Results by Site

Wind Rose
Monterey County Chlorthal Dimethyl Background
April 12 to 13 from 1350 to 0840 (5 minute averaging)



Calms included at center.
Rings drawn at 5% intervals.
Wind flow is FROM the directions shown.
No observations were missing.

PERCENT OCCURRENCE: Wind Speed (Knots)
LOWER BOUND OF CATEGORY

DIR	0	3	6	10	16	21
N	4.39	1.32	0.00	0.00	0.00	0.00
NNE	2.63	0.88	0.00	0.00	0.00	0.00
NE	0.88	0.00	0.00	0.00	0.00	0.00
ENE	2.19	0.00	0.00	0.00	0.00	0.00
E	4.39	1.32	0.00	0.00	0.00	0.00
ESE	3.51	0.88	0.00	0.00	0.00	0.00
SE	0.88	0.00	0.00	0.00	0.00	0.00
SSE	0.44	0.00	0.00	0.00	0.00	0.00

TOTAL OBS = 228 MISSING OBS = 0

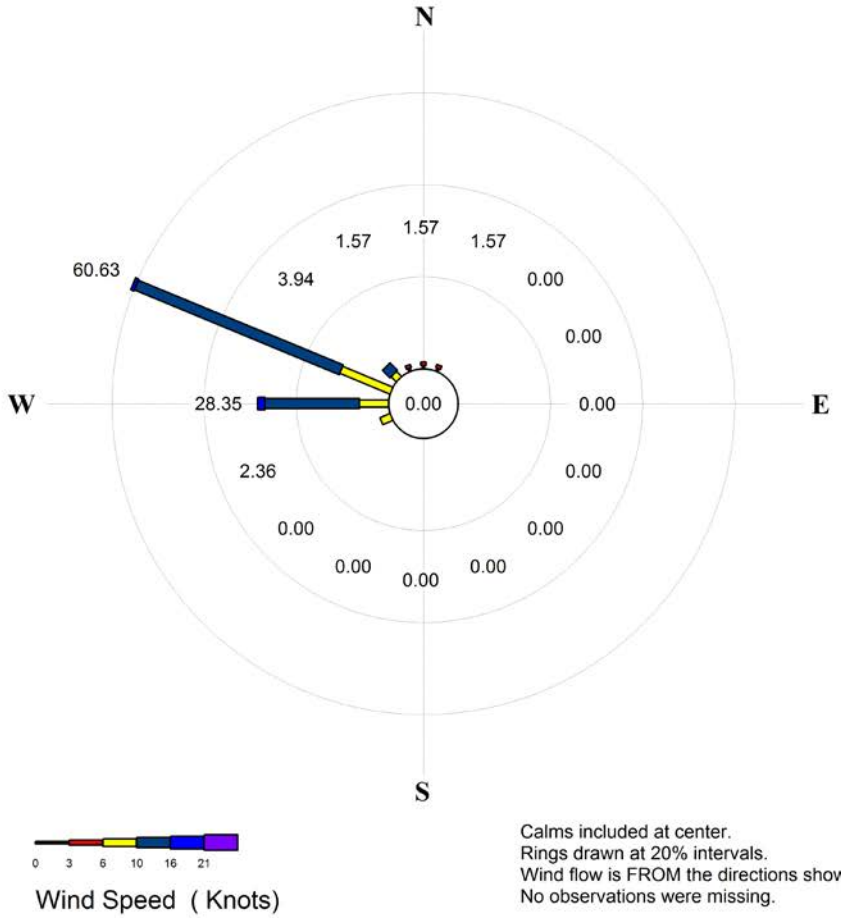
PERCENT OCCURRENCE: Wind Speed (Knots)
LOWER BOUND OF CATEGORY

DIR	0	3	6	10	16	21
S	0.44	0.00	0.00	0.00	0.00	0.00
SSW	0.88	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00
WSW	0.00	0.00	11.40	7.89	0.00	0.00
W	0.44	0.88	15.35	7.46	0.00	0.00
WNW	1.32	3.95	3.07	14.91	0.00	0.00
NW	2.19	1.32	0.00	0.00	0.00	0.00
NNW	2.19	2.19	0.00	0.00	0.00	0.00

CALM OBS = 1 PERCENT CALM = 0.00

Figure 5
Background Wind Rose

Wind Rose
Monterey County Chlorthal Dimethyl Sampling Period 1 Application
April 13 from 0845 to 1915 (5 minute averaging)



Calms included at center.
Rings drawn at 20% intervals.
Wind flow is FROM the directions shown.
No observations were missing.

PERCENT OCCURRENCE: Wind Speed (Knots)
LOWER BOUND OF CATEGORY

DIR	0	3	6	10	16	21
N	0.79	0.79	0.00	0.00	0.00	0.00
NNE	0.79	0.79	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00
ENE	0.00	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	0.00	0.00	0.00
ESE	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00
SSE	0.00	0.00	0.00	0.00	0.00	0.00

TOTAL OBS = 127 MISSING OBS = 0

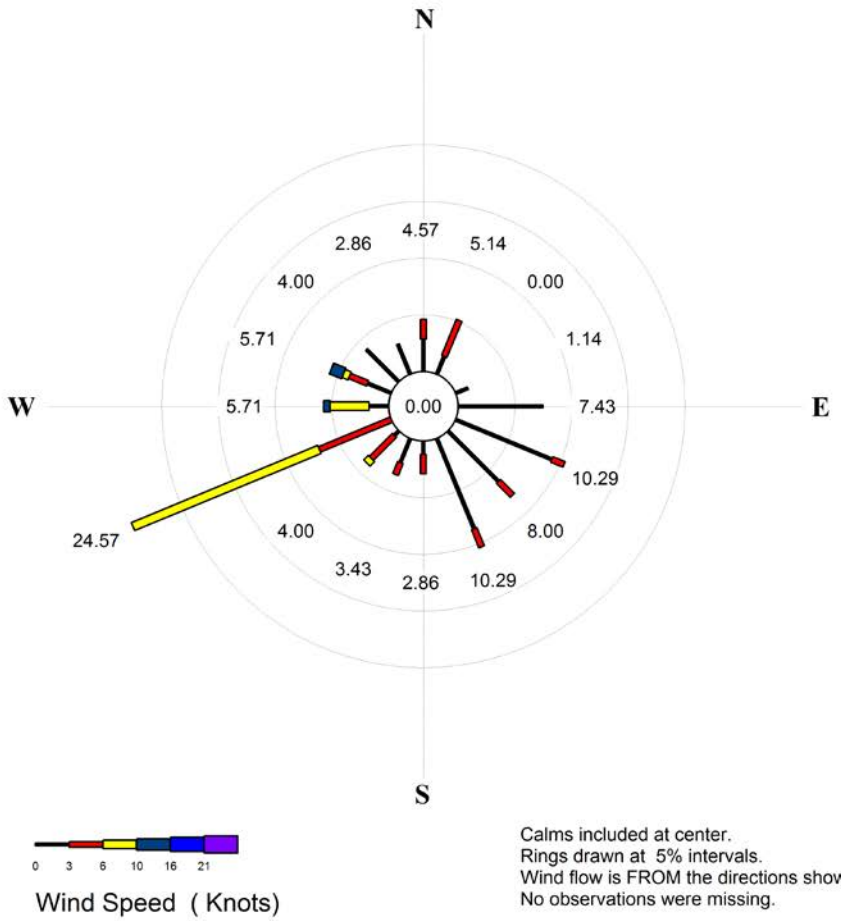
PERCENT OCCURRENCE: Wind Speed (Knots)
LOWER BOUND OF CATEGORY

DIR	0	3	6	10	16	21
S	0.00	0.00	0.00	0.00	0.00	0.00
SSW	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00
WSW	0.00	0.00	2.36	0.00	0.00	0.00
W	0.00	0.00	6.30	20.47	1.57	0.00
WNW	0.00	0.00	11.81	48.03	0.79	0.00
NW	0.00	0.00	1.57	2.36	0.00	0.00
NNW	0.79	0.79	0.00	0.00	0.00	0.00

CALM OBS = 0 PERCENT CALM = 0.00

Figure 6
Sampling Period 1 Application Wind Rose

Wind Rose
Monterey County Chlorthal Dimethyl Sampling Period 2 Overnight
April 13 to 14 from 1815 to 0845 (5 minute averaging)



Calms included at center.
Rings drawn at 5% intervals.
Wind flow is FROM the directions shown.
No observations were missing.

PERCENT OCCURRENCE: Wind Speed (Knots)
LOWER BOUND OF CATEGORY

DIR	0	3	6	10	16	21
N	2.86	1.71	0.00	0.00	0.00	0.00
NNE	1.71	3.43	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00
ENE	1.14	0.00	0.00	0.00	0.00	0.00
E	7.43	0.00	0.00	0.00	0.00	0.00
ESE	9.14	1.14	0.00	0.00	0.00	0.00
SE	6.29	1.71	0.00	0.00	0.00	0.00
SSE	8.57	1.71	0.00	0.00	0.00	0.00

TOTAL OBS = 175 MISSING OBS = 0

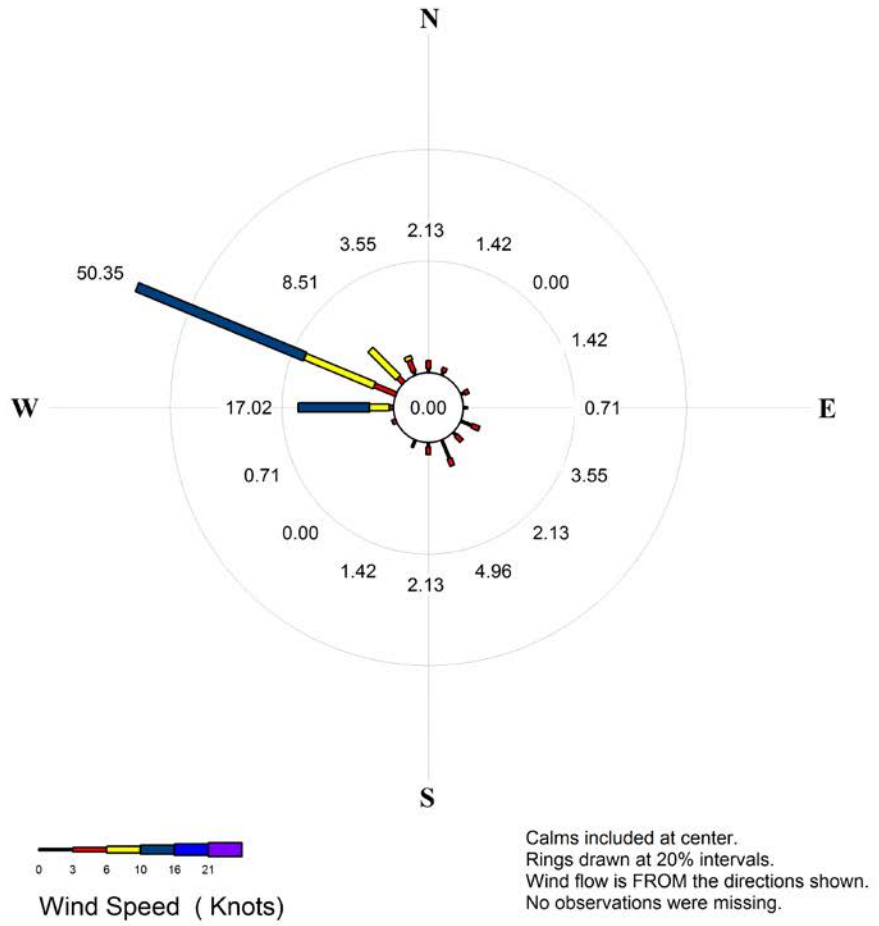
PERCENT OCCURRENCE: Wind Speed (Knots)
LOWER BOUND OF CATEGORY

DIR	0	3	6	10	16	21
S	1.14	1.71	0.00	0.00	0.00	0.00
SSW	2.29	1.14	0.00	0.00	0.00	0.00
SW	0.57	2.86	0.57	0.00	0.00	0.00
WSW	0.00	6.86	17.71	0.00	0.00	0.00
W	1.71	0.00	3.43	0.57	0.00	0.00
WNW	2.29	1.71	0.57	1.14	0.00	0.00
NW	4.00	0.00	0.00	0.00	0.00	0.00
NNW	2.86	0.00	0.00	0.00	0.00	0.00

CALM OBS = 0 PERCENT CALM = 0.00

Figure 7
Sampling Period 2 Overnight Wind Rose

Wind Rose
Monterey County Chlorthal Dimethyl Sampling Period 3 Daytime
April 14 from 0735 to 1915 (5 minute averaging)



Calms included at center.
Rings drawn at 20% intervals.
Wind flow is FROM the directions shown.
No observations were missing.

PERCENT OCCURRENCE: Wind Speed (Knots)
LOWER BOUND OF CATEGORY

DIR	0	3	6	10	16	21
N	0.71	1.42	0.00	0.00	0.00	0.00
NNE	0.71	0.71	0.00	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00
ENE	0.71	0.71	0.00	0.00	0.00	0.00
E	0.71	0.00	0.00	0.00	0.00	0.00
ESE	2.13	1.42	0.00	0.00	0.00	0.00
SE	0.71	1.42	0.00	0.00	0.00	0.00
SSE	3.55	1.42	0.00	0.00	0.00	0.00

TOTAL OBS = 141 MISSING OBS = 0

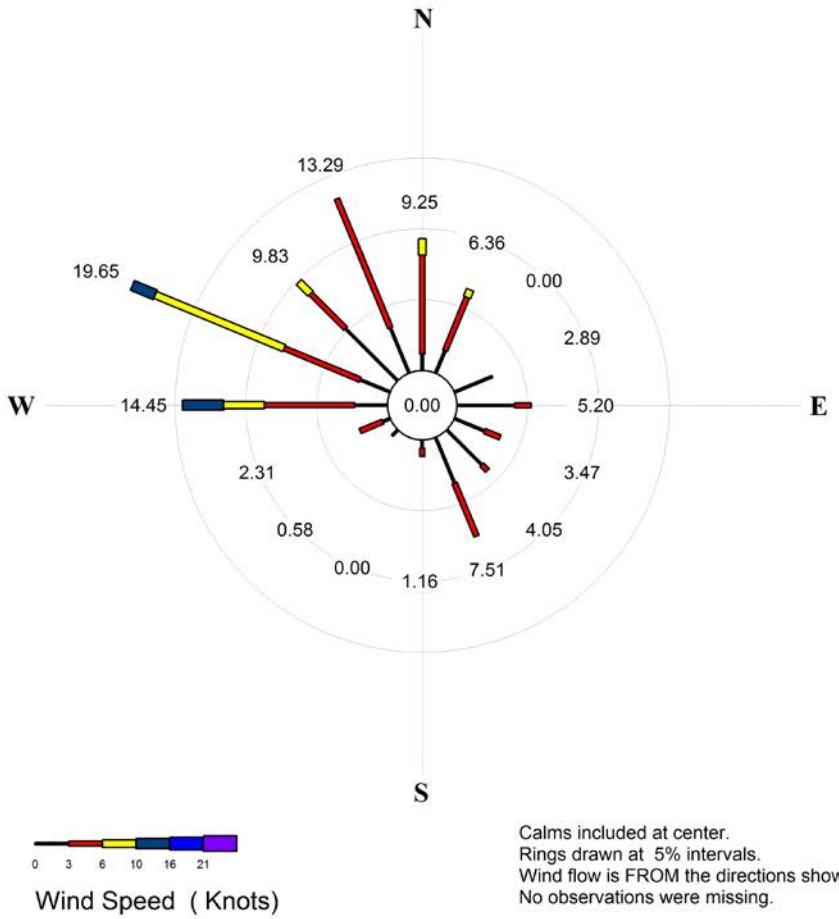
PERCENT OCCURRENCE: Wind Speed (Knots)
LOWER BOUND OF CATEGORY

DIR	0	3	6	10	16	21
S	0.71	1.42	0.00	0.00	0.00	0.00
SSW	1.42	0.00	0.00	0.00	0.00	0.00
SW	0.00	0.00	0.00	0.00	0.00	0.00
WSW	0.00	0.71	0.00	0.00	0.00	0.00
W	0.00	0.71	3.55	12.77	0.00	0.00
WNW	0.00	4.26	13.48	32.62	0.00	0.00
NW	0.00	1.42	7.09	0.00	0.00	0.00
NNW	0.71	2.13	0.71	0.00	0.00	0.00

CALM OBS = 0 PERCENT CALM = 0.00

Figure 8
Sampling Period 3 Daytime Wind Rose

Wind Rose
Monterey County Chlorthal Dimethyl Sampling Period 4 Overnight
April 14 to 15 from 1815 to 0835 (5 minute averaging)



Calms included at center.
Rings drawn at 5% intervals.
Wind flow is FROM the directions shown.
No observations were missing.

PERCENT OCCURRENCE: Wind Speed (Knots)
LOWER BOUND OF CATEGORY

DIR	0	3	6	10	16	21
N	1.16	6.94	1.16	0.00	0.00	0.00
NNE	1.73	4.05	0.58	0.00	0.00	0.00
NE	0.00	0.00	0.00	0.00	0.00	0.00
ENE	2.89	0.00	0.00	0.00	0.00	0.00
E	4.05	1.16	0.00	0.00	0.00	0.00
ESE	2.31	1.16	0.00	0.00	0.00	0.00
SE	3.47	0.58	0.00	0.00	0.00	0.00
SSE	3.47	4.05	0.00	0.00	0.00	0.00

TOTAL OBS = 173 MISSING OBS = 0

PERCENT OCCURRENCE: Wind Speed (Knots)
LOWER BOUND OF CATEGORY

DIR	0	3	6	10	16	21
S	0.58	0.58	0.00	0.00	0.00	0.00
SSW	0.00	0.00	0.00	0.00	0.00	0.00
SW	0.58	0.00	0.00	0.00	0.00	0.00
WSW	0.58	1.73	0.00	0.00	0.00	0.00
W	2.31	6.36	2.89	2.89	0.00	0.00
WNW	2.31	5.78	9.83	1.73	0.00	0.00
NW	5.20	3.47	1.16	0.00	0.00	0.00
NNW	3.47	9.83	0.00	0.00	0.00	0.00

CALM OBS = 0 PERCENT CALM = 0.00

Figure 9
Sampling Period 4 Overnight Wind Rose

The Formulas Used to Calculate Monitoring Results

$$\text{Sample Volume } m^3 = \frac{(\text{Sample Flow liters})}{(\text{minute})} \times (\text{Sample Time minute}) \times \frac{(1\ m^3)}{(1000 \text{ liters})}$$

$$\text{Chlorthal-Dimethyl } \frac{\mu g}{m^3} = \frac{(\text{Chlorthal } \mu g)}{(\text{Sample})} \times \frac{(\text{Sample})}{(\text{Total Volume } m^3)}$$

$$\text{Chlorthal-Dimethyl } \frac{\mu g}{\text{sample}} = \frac{(\text{Chlorthal } \mu g)}{(\text{ml})} \times \frac{(3 \text{ ml Extraction Volume})}{(1 \text{ Sample})}$$

$$\text{Chlorthal-Dimethyl } \frac{\mu g}{ml} = \frac{(\text{Chlorthal } \mu g)}{(m^3)} \times \frac{(\text{Sample Volume } m^3)}{(1 \text{ Sample})} \times \frac{(1 \text{ Sample})}{(3 \text{ ml Extraction Volume})}$$

***Note**: 3 ml sample dilution Extraction Volume per sample*

Calculating Percent Recovery of Field Spikes (FS)

$$\text{Difference } \frac{\mu g}{m^3} = \text{FS } \frac{\mu g}{m^3} - \text{Primary Sample } \frac{\mu g}{m^3}$$

$$\text{Percent Recovery \%} = \frac{(\text{Difference } \mu g)}{m^3} \times \frac{(\text{FS Volume } m^3)}{(\text{FS Concentration } \frac{\mu g}{ml})} \times 100$$

***Note**: The Laboratory Field Spike Concentrations were 0.150 $\frac{\mu g}{ml}$*

Calculating Chlorthal-Dimethyl Application Rate lbs. /acre

$$\frac{822.0 \text{ fluid oz.}}{128.0 \text{ oz. /gallon}} = 6.42 \text{ gallons of Dacthal Flowable product}$$

$$\frac{(6.42 \text{ gallons Dacthal Flowable product}) \times (6.00 \text{ lbs. chlorthal-dimethyl/gallon})}{(8.8 \text{ acres})} = 4.38 \text{ lbs. chlorthal-dimethyl /acre}$$

***Note**: Per manufacture's listed product label specification sheet Dacthal Flowable Herbicide contains 6.00 lbs. of chlorthal-dimethyl/gallon*

5.0 Quality Control Results

The quality control results from the Special Analysis Laboratory Section of MLD's Northern Laboratory Branch are presented in Appendix D, "Chlorthal Analytical Results for Application Air Monitoring Samples in Monterey County."

Laboratory staff analyzes a system blank with each analytical batch, before the calibration, after the control and check samples, and after every tenth sample, and after samples containing high levels of chlorthal-dimethyl or co-extracted contaminants. The staff defines an analytical batch as all the samples extracted together, but not to exceed 20 samples. The system blank is analyzed to ensure the solvent and instrument does not contribute interferences to the analysis, and to minimize carryover from high level samples. All system blanks were less than the MDL.

- Method Blanks: Laboratory staff analyzed a method blank with each analytical batch. This is an XAD tube prepared and analyzed as described for the ambient samples. All method blanks were less than the MDL. The MDL level was 0.06 µg/sample

- Laboratory staff analyzed a Laboratory Control Standard (LCS) with each analytical batch. The LCS is an XAD tube spiked with 0.150 µg/ml of chlorthal-dimethyl. The LCS is extracted and analyzed as described for the samples. The LCS averaged 89.2% with a standard deviation of 1.6%.

- Following standard lab procedures, laboratory staff analyzed a Continuing Calibration Verification (CCV) after every calibration curve, after every tenth sample and at the end of an analytical batch. The CCV must be within ± 25% of the expected value. If any of the CCVs are outside this limit, the affected samples are re-analyzed. The CCV standard for each analytical batch was 0.250 µg/ml. All CCV's were in the expected range.

- Field Spikes: The four field spikes were collected in the SEC quadrant. Samples were collected during the application and the three post-application periods. All field spikes were prepared with 0.150 µg/ml of chlorthal-dimethyl. The recoveries were 108% (during application) and 85%, 133% and 84% (during post application). Refer to Table 5

- Trip Spikes: The trip spike recoveries ranged from 77% to 86%. Refer to Table 6

- Lab Spikes: The two laboratory spikes for this study reported a recovery of 84% and 89%. Refer to Table 7

Log #	Sample Location	Expected µg/ml	Measured µg/ml	Measured µg/m³	Primary Sample µg/m³	Difference Spike-Primary	Recovery %
P018	SEC-FS-1	0.150	0.162	0.258	0.000 <LOD	0.258	108
P028	SEC-FS-2	0.150	0.127	0.162	0.000 <LOD	0.162	85
P038	SEC-FS-3	0.150	0.371	0.547	0.253	0.294	133
P048	SEC-FS-4	0.150	0.170	0.202	0.052	0.150	84

Table 5
Quality Control Data Field Spikes

Log #	Sample Location	Date Collected	Date Analyzed	Expected µg/ml	Measured µg/ml	Difference µg/ml	Recovery %
P050	Trip Spike 1	4/15/2011	4/20/2011	0.150	0.121	0.029	81
P051	Trip Spike 2	4/15/2011	4/21/2011	0.150	0.115	0.035	77
P052	Trip Spike 3	4/15/2011	4/22/2011	0.150	0.129	0.021	86
P053	Trip Spike 4	4/15/2011	4/25/2011	0.150	0.123	0.027	82

Table 6
Quality Control Data Trip Spikes

Sample Location	Date Analyzed	Expected µg/ml	Measured µg/ml	Difference µg/ml	Recovery %
Lab Spike 1	4/18/2011	0.150	0.126	0.024	84
Lab Spike 2	4/22/2011	0.150	0.133	0.017	89

Table 7
Quality Control Data Laboratory Spikes

6.0 Discussion

Fifty-three field samples were collected during the background, application and post-application period (including four field spikes and four trip spikes) from eight different locations around the perimeter of an 8.8 acre broccoli field located in Monterey County. Two laboratory spikes were prepared and held at the laboratory at the same time the field/trip spikes were prepared. No chlorthal-dimethyl was detected during the background or application sampling periods, but the third sampling period had four measured concentrations that were greater than the EQL of 0.1 µg/m³. During the third sampling period, chlorthal-dimethyl was detected in the SEC, S, and EM quadrants with concentrations ranging from 0.224 to 0.298 µg/m³. These four measured concentrations coincide with the wind direction during the third sampling period (See Figure 8 Sampling Period 3 Daytime Wind Rose). The wind was coming out of the northwest and west 50.35% and 17.02% of the time ranging from 6 to 10 knots. The last sampling time shows that these same quadrants (SEC, S, EM) had dropped below the EQL of 0.1 µg/m³. Refer to Figure 9 Sampling Period 4 Overnight Wind Rose Samples. The wind was still coming out of the northwest and west ranging from 9.83% to 19.65%, but the winds calmed down to 3 to 6 knots.

SEC-3 and SEC-C-3 were combined, concentrated and reanalyzed to confirm the presence of chlorthal-dimethyl. There were no other peaks in the GC/ECD analysis to indicate the presence of a metabolite.

The low frequency of chlorthal-dimethyl detections may be attributed to the applicator who applied when the winds were calm. Additionally, the field was watered right after the application which limited off-site movement of chlorthal-dimethyl in the air, resulting in low levels of chlorthal-dimethyl in the air at the field samplers which were located 20 meters away from the treated field edges.

APPENDIX A

Department of Pesticide Regulation Request to the Air Resource Board for Proposed Toxic Air Contaminants Monitoring for 2011

Mary-Ann Warmerdam
Director

Department of Pesticide Regulation

Arnold Schwarzenegger
Governor

M E M O R A N D U M

TO: James Goldstene
Executive Officer
Air Resources Board
1001 I Street
Sacramento, California 95814

FROM: Chris Reardon
Chief Deputy Director
916-445-4000

DATE: DRAFT 10-25-10

SUBJECT: PROPOSED TOXIC AIR CONTAMINANT MONITORING FOR 2011

Pursuant to Food and Agricultural Code section 14022(c), the Department of Pesticide Regulation (DPR) requests that the Air Resources Board (ARB) monitor for the following pesticides in 2011:

- 1,3-dichloropropene
- Carbaryl
- Chlorthal-dimethyl
- Methyl bromide
- Methyl iodide

DPR's requests that ARB continue the simultaneous ambient air monitoring for three fumigants: 1,3-dichloropropene, methyl bromide, and methyl iodide. Last year, DPR requested monitoring for these fumigants for a 15-month period. Consistent with the original request, this monitoring should continue at both the Camarillo site and Santa Maria site through October 2011. DPR has not made a final decision regarding the registration of products containing methyl iodide. However, ARB's monitoring should continue to include this pesticide, pending a final decision.

DPR also requested that ARB conduct an application-site study for chlorthal-dimethyl (dacthal, DCPA) last year, including the monomethyl tetrachloroterephthalate (MTP) and tetrachloroterephthalic acid (TPA) breakdown products. ARB staff were unable to conduct this monitoring due to travel and overtime constraints beyond their control. Therefore, DPR requests that ARB conduct this monitoring in 2011.

DPR requests that ARB conduct an application-site study for carbaryl. Carbaryl is a hazardous air pollutant, and was administratively listed as a toxic air contaminant. DPR's risk assessment for this pesticide is currently in progress, and air monitoring will provide data needed for a complete evaluation of the exposure. ARB previously conducted ambient air monitoring for carbaryl in 2007. Additional ambient monitoring is not needed at this time.

DPR requests the following target quantitation limits:

- 1,3-dichloropropene: 0.1 ppb for each isomer (current ARB quantitation limit)
- Carbaryl: 0.04 $\mu g/m^3$
- Chlorthal-dimethyl and breakdown products: 0.1 $\mu g/m^3$
- Methyl bromide: 0.03 ppb (current ARB quantitation limit)
- Methyl iodide: 0.1 ppb (current ARB quantitation limit)

Thank you for your consideration of this request. If you have any questions, please feel free to contact me, or John S. Sanders, Ph.D., of my staff, at 916-324-4155 or <jsanders@cdpr.ca.gov>.

cc: John S. Sanders, Ph.D., DPR Environmental Program Manager
Joan E. Denton, Ph.D., Office of Environmental Health Hazard Assessment Director
Kenneth Stroud, ARB Branch Chief

Air Resources Board

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Linda S. Adams
Acting Secretary for Environmental Protection

Edmund G. Brown Jr.
Governor

TO: Chris Reardon
Chief Deputy Director
Department of Pesticide Regulation

FROM: James N. Goldstene
Executive Officer

DATE: March 29, 2011

SUBJECT: PROPOSED TOXIC AIR CONTAMINANT MONITORING FOR 2011

This is in response to your memorandum requesting the Air Resources Board (ARB) monitor the following pesticides in 2011:

- 1,3-dichloropropene
- Carbaryl
- Chloropicrin
- Chlorthal-dimethyl
- Methyl bromide
- Methyl iodide

Specifically, the Department of Pesticide Regulation (DPR) requests ARB to continue the 15 month simultaneous ambient air monitoring for four fumigants: 1,3-dichloropropene (1,3-D), methyl bromide, methyl iodide and chloropicrin. Monitoring for these four fumigants is currently underway at two sites (Camarillo and Santa Maria). Monitoring will end October 2011.

DPR also requests ARB to conduct an application site study for chlorthal-dimethyl, and if possible, the monomethyl tetrachloroterephthalate and tetrachloroterephthalic acid breakdown products. DPR has already provided monitoring recommendations which include high use dates and locations.

Lastly, DPR also requests ARB to conduct an application site study for carbaryl. DPR has already provided monitoring recommendations which include high use dates and locations.

I have directed my staff at ARB's Monitoring and Laboratory Division to include 1,3-D, chloropicrin, methyl bromide, and methyl iodide in their 2011 air monitoring test schedule. To the extent possible, we will include the application site study requests for

chlorthal-dimethyl and carbaryl. As these studies are dependant on the cooperation of growers and their pesticide application schedules, weekend and extended hours are often necessary. Furlough and overtime restrictions could impair our ability to complete these studies.

If you have any questions, please contact Ken Stroud at (916) 445-3745 or via email at kstroud@arb.ca.gov.

cc: George Alexeeff, Ph.D.
Acting Director
Office of Environmental Health Hazard Assessment

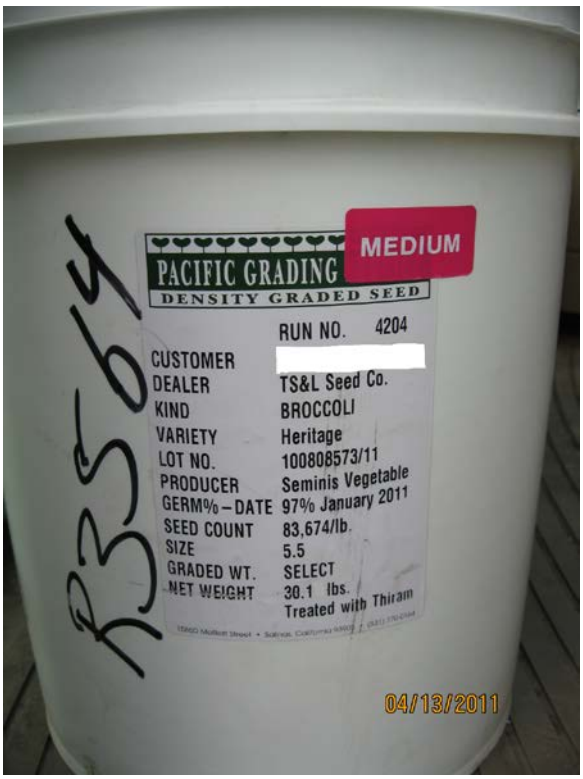
John S. Sanders, Ph.D.
Environmental Program Manager II
Department of Pesticide Regulation

Ken Stroud, Chief
Air Quality Surveillance Branch

APPENDIX B

Site Photographs

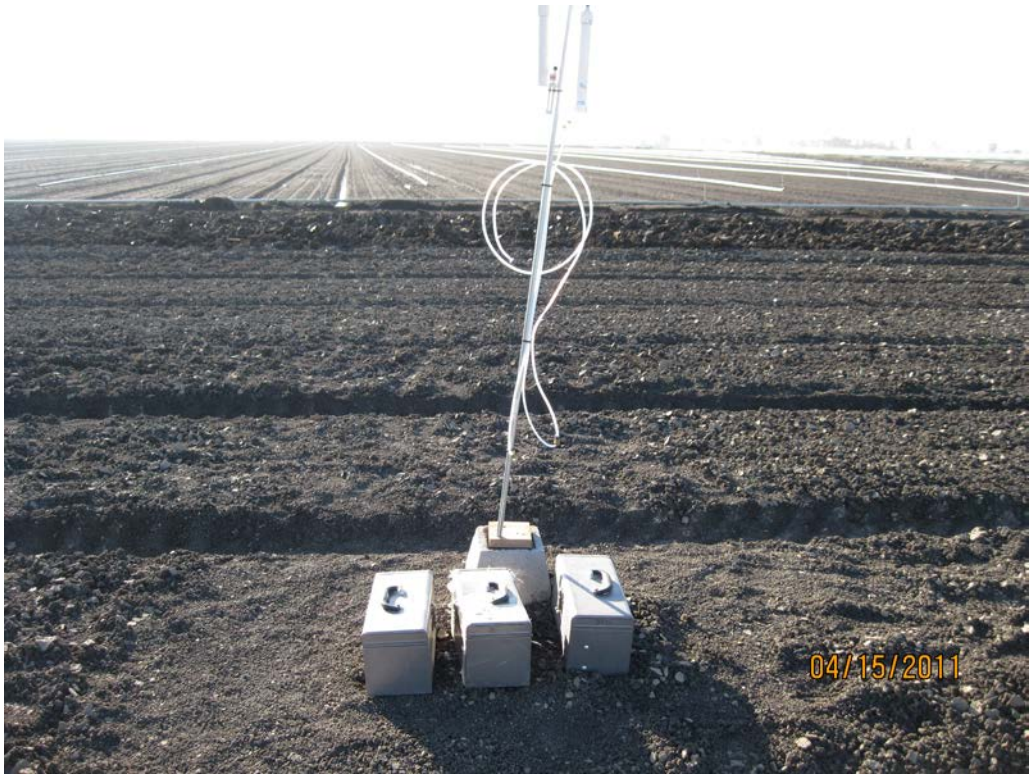
Chlorthal in tanks and broccoli seeds being loaded before application



Broccoli seeds which were loaded prior to Chlorthal

Watering after Chlorthal application and seeding

Sampling Site NEC



Sampling Site N

Sampling Site NWC

Sampling Site WM

Sampling Site SWC

Sampling Site S

Sampling Site SEC and Co-Located

Sampling Site EM

Difficult driving conditions

Sampler Site EM

Swapping out batteries at SEC

APPENDIX C

Sampling Protocol

California Environmental Protection Agency
AIR RESOURCES BOARD

Monitoring and Laboratory Division
Air Quality Surveillance Branch

Sampling Protocol for Chlorthal-Dimethyl (Dacthal) Application Study

March 22, 2011

Prepared by:

Steve Aston
Air Resources Engineer
Special Purpose Monitoring Section

Signatures:

_____
Kenneth R. Stroud, Chief Date
Air Quality Surveillance Branch
Air Resources Board

_____
Mac McDougall, Manager Date
Special Purpose Monitoring
Air Quality Surveillance Branch

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Appendix

APPENDIX A: Standard Operating Procedure Sampling and Analysis of Chlorthal-Dimethyl (DCPA).

1.0 Introduction

The California Department of Pesticide Regulation's (DPR) memorandum dated January 28, 2011, "Proposed Toxic Air Contaminant Monitoring For 2011", requests that the Air Resources Board (ARB) conduct a comprehensive air monitoring study for the herbicide Chlorthal-Dimethyl (DCPA) during a ground application.

This study will consist of five sampling periods.

1) A background sample period duration time minimum 12 hours (arrival Tuesday)
2) An application sampling period begins Wednesday morning prior to application and is removed one (1) hour before sunset.
3) A post application overnight sampling period begins Wednesday evening one (1) hour before sunset and is removed one (1) hour after sunrise Thursday morning.
4) A post application daytime sampling period begins Thursday morning one (1) hour after sunrise and is removed one (1) hour before sunset.
5) A post application overnight sampling period begins Thursday evening one (1) hour before sunset and is removed one (1) hour after sunrise Friday morning.

The background sampling period will be performed twelve to twenty-four hours prior to the application of DCPA. The application sampling period will begin thirty minutes prior to the application of DCPA. There will be a total of 62 resin sorbent tube samples eight (8) background, five (5) collocated, five (5) field spikes, one (1) trip spike, one (1) trip blank, 32 application/post application and ten (10) spares.

Background sampling will be started the day before the application and end approximately one (1) hour prior to the start of the application or when the elapsed time reaches a minimum of 12 hours. Eight (8) background samplers will be placed around the perimeter of the field along with one (1) collocated sampler and one (1) field spike sampler on the downwind side.

2.0 Project Goals and Objectives

The primary goal of this monitoring project is to measure the concentrations of DCPA in the ambient air during and after application.

To achieve the project goal, the following objectives should be met:

1. Identification of monitoring sites that mutually satisfies criteria for ambient air sampling and DPR's requirements.

2. Appropriate application of sampling/monitoring equipment to determine DCPA concentrations in the air adjacent to the application.

3. Application of relevant field quality assurance/quality control practices to ensure the integrity of field samples.

4. A final report containing all relevant information, data and results gathered in the course of MLD's activities during the planning and execution of this project.

3.0 Contacts

Mac McDougall, Manager
Special Purpose Monitoring Section
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Pam Wofford, Agriculture Program Supervisor
Department of Pesticide Regulation
Office 916-825-8076
pwofford@cdpr.ca.gov

4.0 Study Location

A DCPA application is planned for March 28, 2011 in the Monterey County. The field is located 2 miles south of Salinas on the east side of Highway 101.

5.0 Study Design

The DCPA sampling schedule is listed in Table 1 (Sampling Periods). For March 28, 2011 sunrise occurs at 0659 PST and sunset occurs at 1925 PST.

Due to the State of California's current furlough and overtime policies one (1) day and one (1) night of sampling will be removed from the recommended sampling schedule provided by the California Department of Pesticide Regulations.

TABLE 1: SAMPLING PERIODS

Sample Period Begins	Sample Duration/Event Time
Background (Sunday Arrival)	Minimum 12-24 hours (Pre-Application)
Application (8 PST Monday Morning)	Sample is removed one (1) hour before sunset (Application)
Post application (Monday Evening)	Sample is installed one (1) hour before sunset (Overnight)
Post application (Tuesday Morning)	Sample is installed one (1) hour after sunrise (Daytime)
Post application (Tuesday Evening)	Sample is installed one (1) hour before sunset (Overnight)

a) Background sampling will start the day before the application for a minimum of twelve hours, but no more than twenty four hours. The background samples will be removed at least one (1) hour prior to the start of the application. The background samplers will be installed at all four corners and at each of the four sides of the field at quarterly lengths with one (1) field spike sampler and one (1) collocated sampler next to the downwind site for a total of ten (10) samplers. The field spike samples will be pre-spiked with a concentration of 0.6 micrograms of DCPA.

b) The application sampling period will start approximately thirty minutes prior to the ground application of DCPA and will continue until one (1) hour before sunset. A post application overnight sampling period will start one (1) hour before sunset and continue until one (1) hour after sunrise. A second post application daytime sampling period will start one (1) hour after sunrise and will continue until one (1) hour before sunset. A third post application overnight sampling period will start one (1) hour before sunset and will continue until one (1) hour after sunrise.

c) There will be eight (8) sampling sites around the orchard. For a square field, four (4) sites will be located at each corner and four (4) sites will be located at quarterly lengths on each side. The projected downwind site will have two additional samplers, one (1) collocated and one (1) field spike, located within 0.6

meters of the primary sampler. All sampler intakes will be 1.7 meters (67 ± 6 inches) above the ground. Samplers will be placed 20 ±10 meters (33 to 98 feet) from the edge of the field.

d) Each sample will be collected by passing a measured volume of ambient air through one XAD resin sorbent tube that is mounted on a sampling tree as shown in Figure 1. Sample flow is controlled by an inline rotameter (flow range of 0-5 LPM) and the resin sorbent tube will be protected from direct sunlight or rain. Prior to each sampling period, the sampler is checked for leaks. After the sample resin sorbent tube is installed, the flow rate will be set at 3.0 lpm using a digital mass flow meter. The flow rate will be checked at the end of each sampling period and the average of the start and stop flows shall be 3.0 lpm ±20%. At the end of each sampling period, the tubes will be placed in culture tubes with an identification label affixed and placed in a dry ice cooler. The field log sheet and resin sorbent tube label will contain the following information: log #, sample name, sampler ID number, start and end date/time, start/end elapsed time meter reading, start/end mass flow meter display reading, comments (if applicable), weather conditions and the start/end initials of the operator. The exposed XAD-2 resin sorbent tubes (SKC #226-30-06) with 400 and 200 mg of packing are stored in an ice chest (on dry ice) or in a freezer until extracted in the laboratory.

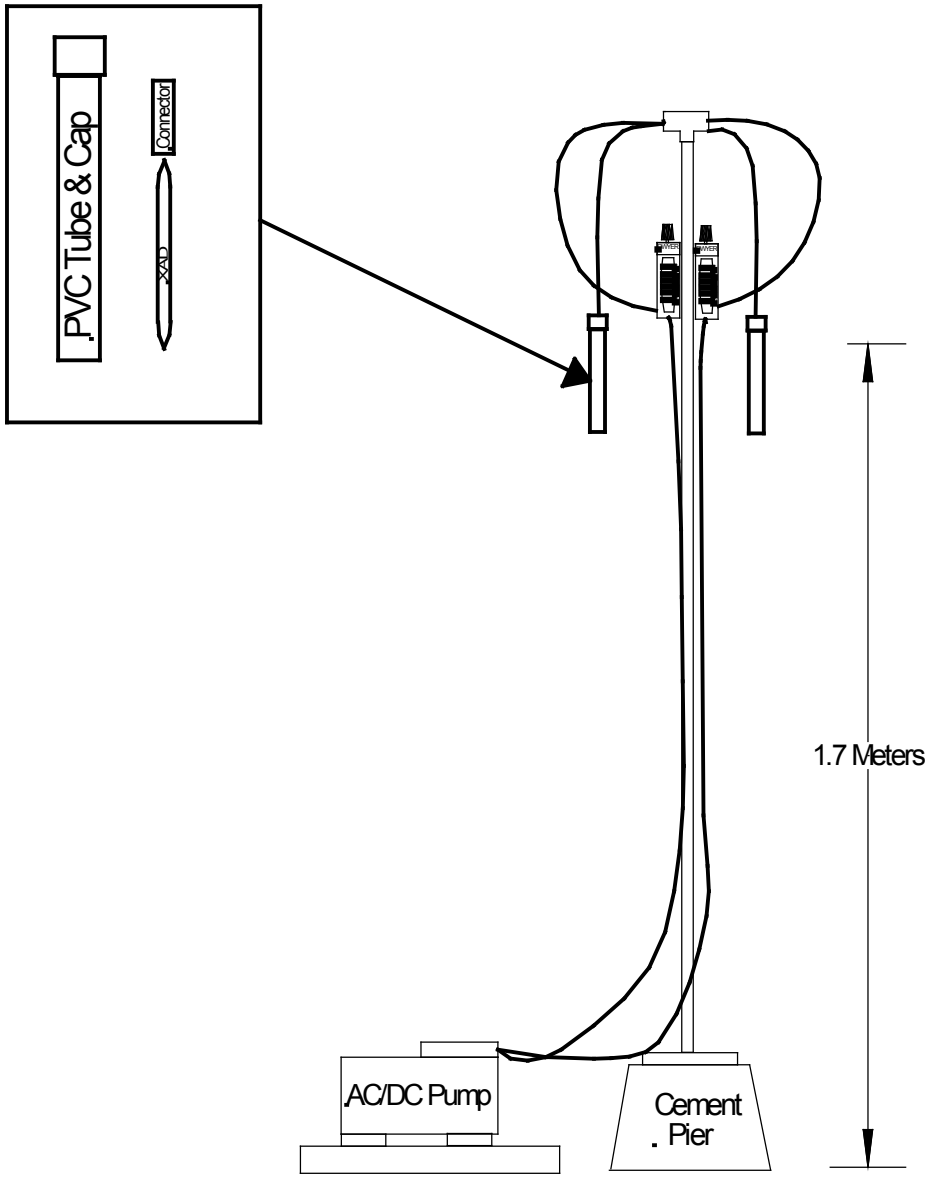

FIGURE 1: AIR SAMPLER TREE WITH PUMP

e) In order to reduce direct exposure to ARB staff during the pesticide application period all samplers will begin a minimum of thirty minutes prior to the start of the application. At the end of each sampling period the following general procedure will occur at each site; flows will be verified, documentation completed, all resin sorbent tubes removed, the battery replaced, a new resin sorbent tube installed and flows adjusted if necessary. Field notes and observations will be recorded (such as DCPA application flow rate and total amount of DCPA applied).

f) Meteorological data will be collected using a Met-One Automet portable meteorology system. The Automet will be located no closer than twenty meters from the edge of the field being monitored. The meteorological sensors will be installed between 5.9 and 6.9 meters above the ground. The AutoMet station will continuously measure and record 5 minute averages for wind speed, wind

direction, ambient temperature and percent relative humidity throughout the background and application sampling periods.

g) The MLD will provide DPR with a final report containing all relevant information, collected data and analytical results gathered during the course of the study.

6.0 Sampling and Analysis Procedures

Special Purpose Monitoring Section (SPM) staff will hand-carry resin sorbent tubes to and from MLD's laboratory in Sacramento, and to and from the sampling location. The resin sorbent tubes will not be exposed to extreme conditions or subjected to rough handling that might cause loss or degradation of sample. At the end of the each sampling period, all resin sorbent tubes will be removed from the sampler, placed in a culture tube, labeled, and secured in a dry ice cooler.

At each sampling site, the operator will replace the batteries for each pesticide sampler with charged batteries; install a new resin sorbent tube and install the rain/sun shield over the resin tube. The resin sorbent tube field log sheet (See Figure 2) shall be filled out a long with the resin sorbent tube label. Prior to any sampling, flows will be set to 3.0 $\pm$ 0.1 lpm. At the start of each sampling period, the pesticide samplers will be manually turned on and the start date, time, elapsed time meter reading and indicated flow rate will be recorded. At the end of each sampling period, the flow rate will be measured, the pesticide sampler manually shut off and the following recorded on the resin sorbent tube field log sheet; end date, time, elapsed time meter reading and flow.

Sampling will occur as scheduled unless ambient conditions at the start include rain or instantaneous gusts of wind over ten (10) miles per hour. All reported sampling times, including meteorological data, will be reported in Pacific Standard Time (PST).

The Northern Laboratory Branch (NLB) will supply Special Purpose Monitoring with 62 resin sorbent tubes; eight (8) backgrounds, five (5) collocated, five (5) field spikes, one (1) trip spike, one (1) trip blank, 32 application/post application and ten (10) spares. A label will be affixed around the top section of the resin sorbent tube identifying the sample. Spikes and other QC resin sorbent tubes will be identified. The NLB will perform analyses for DCPA on all collected samples and report results to SPM in electronic format (Excel) and hardcopy. Laboratory analysis will be performed in accordance with the draft standard operating procedures, "Standard Operating Procedure Sampling and Analysis of Clorthal-Dimethyl (DCPA)." The current analytical Method Detection Limit (MDL) is 100 nanograms (ng) per sample for DCPA. The laboratory's operating procedure is included in this Protocol as Appendix A.

The following resin sorbent tube validation and analytical quality control criteria will be followed during pesticide analysis.

1. **Sample Hold Time**: Sample hold time criteria will be consistent with the laboratory's operation procedure stated 28 days.

2. **Duplicate Analysis**: Laboratory to provide duplicate analytical results and the corresponding relative percent difference (RPD)

3. **Method Detection Limit (MDL)**: Sample analysis results less than the MDL shall be reported as a less than numerical value. This less than numerical value shall incorporate any dilutions (dilution factor will be included in the report)

4. **Analytical Linear Range**: Analytical results greater than 10% of the highest calibration standard shall be diluted and reanalyzed within the calibrated linear range.

7.0 List of Field Equipment

Quantity	Item Description
(1)	Met-One Automet portable meteorology system consisting of a data logger and calibrated sensors measuring 5 minute averages for wind speed, direction, ambient temperature, and relative humidity.
(1)	Measuring Wheel
(1)	200 foot measuring tape
(1)	Tripod and compass
(1)	Global Positioning System (GPS) with backup batteries and carrying case
(1)	Digital Camera with backup batteries and carrying case
(2)	Aalborg certified mass flow meter 0-5 lpm
(70)	Resin sorbent tubes (8 backgrounds, 5 collocated, 5 field spikes, 1 trip spike, 1 trip blank, 32 application/post application and 10 spares)
(10)	Pesticide sampler each equipped with one (1) each sampling train and voloflows setup to sample one (1) resin tube.
(12)	Pump, 12 VDC.
(80)	Battery, 12 VDC 40 amps.
(13)	Chargers

8.0 Quality Control

Quality control procedures will be observed to ensure the integrity of samples collected in the field. National Institute of Standards and Technology (NIST) traceable transfer standards will be used to calibrate meteorological sensors and measure sample flow rates.

The sample flow rate of the pesticide sampler's voloflows will be measured using certified mass flow meters with a range of 0-5 liters per minute.

The metrological sensors will be calibrated and aligned following the procedures outlined in the standard operating procedures on the Air Monitoring Web Manual at the following link.

http://arb.ca.gov/airwebmanual/amwmn.php?c=5&t=sop

A label will be affixed around the top section of the resin sorbent tube identifying the sample with the following information: log #, sample name, sampler ID number, start and end date and time, start and end elapsed time meter (ETM) reading, start and end mass flow meter display reading and operators initials.

Collocated (side-by-side) air samplers will operate at one site during the study period. This collocated site will be located at the projected downwind site.

Field Spike (FS): Eight (5) field spikes will be prepared by the laboratory by injecting resin sorbent tubes with a known concentration of DCPA. The field spike resin sorbent tubes will be coupled with a pesticide sampler and collocated next to the projected downwind sampler. One (1) each field spike will be collected during each sampling period.

Trip Spike (TS): A trip spike will be prepared by the laboratory by injecting a resin sorbent tube with a known concentration of DCPA with the same level as the field spikes. The trip spike resin sorbent tube accompanies the sample resin sorbent tubes from the lab to the field but is not sampled.

Trip Blank (TB): A trip blank will be prepared by the field staff. The trip blank resin sorbent tube accompanies the sample resin sorbent tubes from the lab to the field and returns but is not sampled.

Collocated (C): Collocated samples will be collected at the designated down wind sampling site during all sampling periods starting with the background period.

Valid samples are those that have a final corrected average flow within ± 20% of 3.0 lpm.

Site/Sample Identification

The DCPA application sampling sites will be named accordingly for the background, ambient, application, and post application as follows:

Background Site Naming:

BKG-NE-1
BKG-NE-C
BKG-NE-FS-1

Application Site Naming:

NE-1	NE-1C	NE-1FS
SE1-1	SE2-1	
SW1-1	SW2-1	
NWC-1	NEC-1	
SEC-1	SWC-1	

Letter Abbreviations as follows

N = North Side
S = South Side
W = West Side
E = East Side
BKG = Background Sample
FS = Field Spike
C = Co-located
NEC = NE Corner Sample
NWC = NW Corner Sample
SEC = SE Corner Sample
SWC = SW Corner Sample
TS = Trip Spike
TB = Trip Blank
FB = Field Blank

Following the quality control procedures listed above will ensure the quality and integrity of the samples collected in the field and will insure accurate field and laboratory results.

9.0 Deliverables

9.1 Northern Laboratory Branch (NLB) Deliverables

Within 90 days after the last collected sample is received at the laboratory, the NLB will provide SPM with a report that will include the following topics:

1) Table(s) of sample to include:
   a. Sample identification (name).
   b. Date sample received from field.
   c. Date sample analyzed.
   d. Dilution ratio.
   e. Analytical results.
2) All equations used in calculating analytical results.
3) Table of duplicate results including calculated relative percent difference (RPD) when applicable.
4) Table of collocated results.
5) Table of analytical results from all field, trip and laboratory spikes including percent recoveries when applicable.
6) Table of analytical results from all trip blanks.
7) Table of analytical results from all laboratory blanks, standards and control checks performed, including dates performed and relative percent recoveries when applicable.
8) Copy or location of analytical method or Standard Operating Procedures (SOP) used for analysis.
9) Section or provision listing or reporting any and all deviations from analytical SOP and this protocol.

9.2 Air Quality Surveillance Branch Deliverables

Within 90 days from receipt of the final results report from the NLB, AQSB will provide DPR with a report containing the following topics:

1) Sampling Protocol.
2) Personnel Contact List.
3) Site Maps.
4) Site Photographs.
5) Site Descriptions and Measurements (site, sampler, GPS coordinates, inlet height, distance to roads, site-specific comments, DCPA application rate, and total pounds or gallons of DCPA applied).
6) Sample Summary Table.
7) Field Log Sheets.
8) Laboratory Analysis Reports with calculations in electronic format.
9) Met Station and Sampler Calibration Reports.
10) Transfer Standards' Certification Reports.
11) Disk containing electronic files of 5-minute averaged Meteorological Data.
12) Disk containing electronic files of Report.

XAD-2 RESIN SORBENT TUBE FIELD LOG SHEET

Project: DCPA Pesticide Application Air Monitoring

Start Flow Set: 3.0 ±0.1 lpm End Flow Criteria: 3.0 lpm ±20%

Log #	Sample Name	Sampler ID Number	Date & Time Entry Example (6/14/08 13:42)		Elapsed Time Meter (ETM)		Mass Flow Meter Display		Corrected Average Flow	Comment Number	Weather K,P,C,F&R		Initials	
			Start	End	Start	End	Start	End			Start	End	Start	End

MFM Used #: _____ **Slope:** _____ **Intercept:** _____

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Weather Codes: K = Clear, P = Partly Cloudy, C = ≥67% Cloudy, F = Fog and R = Rain (any)

Figure 2: Resin Sorbent Tube Field Log Sheet

APPENDIX A: Standard Operating Procedure Sampling and Analysis of Chlorthal-Dimethyl (DCPA).

The Special Analysis Section of MLD's Northern Laboratory Branch will perform the analyses for DCPA collected by the resin sorbent tube method. This analytical procedure is entitled, "Standard Operating Procedure Sampling and Analysis of Chlorthal-Dimethyl (DCPA)" and can be located starting on the next page.

APPENDIX D

Laboratory Results Report

California Environmental Protection Agency

Air Resources Board

Chlorthal Analytical Results for Application Air Monitoring Samples in Monterey County

DATE: June 20, 2011

Prepared by
T.E. Houston, PhD
Air Pollution Specialist

Special Analysis Section
Northern Laboratory Branch
Monitoring and Laboratory Division

Reviewed and Approved by

Russell Grace, Manager
Special Analysis Section

This report has been reviewed by staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names of commercial products constitute endorsement or recommendation for use.

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1.0 INTRODUCTION

The Department of Pesticide Regulation (DPR) requested the Air Resources Board (ARB) conduct application air monitoring for chlorthal (Dimethyl-2,3,5,6-tetrachloroterephthalate [Chlorthal-dimethyl or Dacthal]) and associated breakdown products, monomethyl tetrachloroterephthalate (MTP) and tetrachloroterephthalic acid (TPA). This report covers the analytical and quality assurance results for chlorthal during an application in Monterey County in April 2011. DPR requested a method estimated quantitation limit (EQL) of 0.1 micrograms per cubic meter (µg/m^3). The EQL achieved during this project was 0.1 µg/m^3 based on 24-hour collection at three liters per minute (LPM).

2.0 METHOD DEVELOPMENT

2.1 Overview

Application air samples are collected on XAD-2 sorbent tubes. Sampled tubes are stored at four (4) degrees centigrade (°C) or lower prior to extraction. Sample tubes are extracted using pesticide grade ethyl acetate. Sample analysis is performed using a gas chromatograph/electron capture detector. Analysis and quantitation uses external standard method for instrument calibration. Estimated quantitation level for this method is 0.1 µg/m^3 prior to any sample dilution for sampling at three LPM and a three-milliliter (ml) extraction volume.

Details on the method development for analysis is in a separate document: "Method Development for the Air Sampling and Analysis of Chlorthal (Dimethyl-2,3,5,6-tetrachloroterephthalate)" dated April 22, 2011.

2.2. Minimum Detection Limit (MDL)

The MDL calculation follows the United States Environmental Protection Agency (USEPA) procedures for calculating MDL's. Using the analysis of seven low-level matrix spikes (0.1 µg/ml), the MDL and EQL for a three-ml extract is calculated as follows:

s = the standard deviation of the concentration calculated for the seven replicate spikes.
For chlorthal: s = 0.006 µg/ml
MDL = (3.14) x (s) = (3.14) x (0.006) = 0.018 µg/ml.
MDL for total µg/sample = 0.06 µg/sample
EQL = (5) x (MDL) = (5) x (0.018) = 0.090 µg/ml
EQL for total µg/sample = 0.270 µg/sample

Based on a total collection volume of 4.32 m^3 the EQL would be 0.1 µg/m^3. Staff report results above the EQL to two significant figures. Results below the EQL but greater

than or equal to the MDL are reported to one significant figure. Results less than MDL are reported as the calculated MDL to one significant figure.

3.0 CHLORTHAL APPLICATION AIR MONITORING SAMPLE RESULTS

The laboratory received a total of 53 application samples including four field spikes and four trip spikes. The samples included background, sampling during application, and three post-application samplings. Table 1 presents the results of the analysis by site.

4.0 ANALYTICAL QUALITY CONTROL SAMPLES

4.1 System Blanks

Laboratory staff analyzes a system blank with each analytical batch, before the calibration, after the control and check samples, and after every tenth sample, and after samples containing high levels of chlorthal or co-extracted contaminants. Staff defines the analytical batch as all the samples extracted together, but not to exceed 20 samples. The system blank is run to insure the solvent and instrument do not contribute interferences to the analysis, and to minimize carryover from high level samples. All system blanks were less than the MDL.

4.2 Method Blanks

Laboratory staff analyzed a method blank with each analytical batch. This is an XAD tube prepared and analyzed as described for the ambient samples. All method blanks were less than the MDL.

4.3 Laboratory Control Sample (LCS)

Laboratory staff analyzed a LCS with each analytical batch. The LCS is an XAD tube spiked with 0.15 µg/ml of chlorthal. The LCS is extracted and analyzed as described for the samples. The LCS averaged 89.2% with a standard deviation of 1.6%.

4.4 Continuing Calibration Verification Standards (CCV)

Following standard lab procedures, laboratory staff analyzed a CCV after every calibration curve, after every tenth sample and at the end of an analytical batch. The CCV must be within $\pm$ 25% of the expected value. If any of the CCVs are outside this limit, the affected samples are re-analyzed. The CCV standard for each analytical batch is 0.25 µg/ml. All CCV's were in the expected range.

5.0 FIELD, TRIP, AND LABORATORY SPIKES AND TRIP BLANKS

Four field spikes, four trip spikes and two laboratory spikes were analyzed. The field spikes were on samplers for the respective events analyzed: background, during application, and the three post-application times. Laboratory staff prepared the spikes at 0.15 µg/ml of chlorthal. Table 2 presents the results for the quality control data.

5.1 Field Spikes

The four field spikes were on the samplers in the SEC quadrant. Sample was collected during application and the three post-application times. All spikes were 0.15 µg/ml. The recoveries were 108% (during application) and 85%, 247% and 113% post application. It was during the third sampling that chlorthal at low levels was detected. The concentrations at the SEC site were: 0.148 and 0.181 µg/ml. EQL is 0.1 µg/ml.

5.2 Trip Spikes

The trip spike recoveries ranged from 77% to 86%.

5.3 Laboratory Spikes

The two laboratory spikes for this study had a recovery of 84% and 89%.

6.0 DISCUSSION

The Laboratory received 53 field samples, including four field spikes and four trip spikes. Two laboratory spikes were prepared and held at the laboratory at the same time the field/trip spikes were prepared and sent. There was no chlorthal detected in any of the background, during the application, or the first field samples that were much greater than the EQL of 0.3 µg/sample. During the third sampling time, chlorthal was detected in the SEC, S, and EM quadrants with concentrations ranging from 0.4 to 0.6 µg/sample. The last sampling time shows that these quadrants had dropped to 0.1 µg/sample (<0.3 µg/sample EQL).

Combining and concentrating samples SEC-3 and SEC-C-3, gas chromatograph/mass spectrometer was run to confirm the presence of chlorthal. There were no other peaks in the GC/ECD analysis to indicate the presence of a metabolite.

Table 1: Chlorthal Application Air Monitoring Results by Site for Monterey County 2011.

Log #	Sample location	Sample start	Date analyzed	ug/sample
	NEC			
P001	BKG-NEC	4/12/2011	4/18/2011	<0.06
P010	NEC-1	4/13/2011	4/20/2011	<0.06
P020	NEC-2	4/13/2011	4/21/2011	<0.06
P030	NEC-3	4/14/2011	4/22/2011	<0.06
P040	NEC-4	4/14/2011	4/25/2011	<0.06
	N			
P002	BKG-N	4/12/2011	4/18/2011	<0.06
P011	N-1	4/13/2011	4/20/2011	<0.06
P021	N-2	4/13/2011	4/21/2011	<0.06
P031	N-3	4/14/2011	4/22/2011	<0.06
P041	N-4	4/14/2011	4/25/2011	<0.06
	NWC			
P003	BKG-NWC	4/12/2011	4/18/2011	<0.06
P012	NWC-1	4/13/2011	4/20/2011	<0.06
P022	NWC-2	4/13/2011	4/21/2011	<0.06
P032	NWC-3	4/14/2011	4/22/2011	<0.06
P042	NWC-4	4/14/2011	4/25/2011	<0.06
	WM			
P004	BKG-WM	4/12/2011	4/18/2011	<0.06
P013	WM-1	4/13/2011	4/20/2011	<0.06
P023	WM-2	4/13/2011	4/21/2011	<0.06
P033	WM-3	4/14/2011	4/22/2011	<0.06
P043	WM-4	4/14/2011	4/25/2011	0.06
	SWC			
P005	BKG-SWC	4/12/2011	4/18/2011	<0.06
P014	SWC-1	4/13/2011	4/20/2011	<0.06
P024	SWC-2	4/13/2011	4/21/2011	<0.06
P034	SWC-3	4/14/2011	4/22/2011	<0.06
P044	SWC-4	4/14/2011	4/25/2011	0.07
	S			
P006	BKG-S	4/12/2011	4/18/2011	<0.06
P015	S-1	4/13/2011	4/20/2011	<0.06
P025	S-2	4/13/2011	4/21/2011	<0.06
P035	S-3	4/14/2011	4/22/2011	0.567
P045	S-4	4/14/2011	4/25/2011	0.16
	SEC			
P007	BKG-SEC	4/12/2011	4/18/2011	0.06
P008	BKG-C-SEC	4/12/2011	4/18/2011	<0.06
P016	SEC-1	4/13/2011	4/20/2011	<0.06
P017	SEC-C-1	4/13/2011	4/20/2011	<0.06
P026	SEC-2	4/13/2011	4/21/2011	<0.06
P027	SEC-C-2	4/13/2011	4/21/2011	<0.06
P036	SEC-3	4/14/2011	4/22/2011	0.444
P037	SEC-C-3	4/14/2011	4/22/2011	0.543
P046	SEC-4	4/14/2011	4/25/2011	0.13
P047	SEC-C-4	4/14/2011	4/25/2011	0.12
	EM			
P009	BKG-EM	4/12/2011	4/20/2011	<0.06
P019	EM-1	4/13/2011	4/20/2011	<0.06
P029	EM-2	4/13/2011	4/21/2011	<0.06
P039	EM-3	4/14/2011	4/22/2011	0.420
P049	EM-4	4/14/2011	4/25/2011	0.12

Table 2: Quality Control Data XAD Spikes for Field, Trip, and Laboratory.

Log #	Sample location	Sample start	Date analyzed	ug/ml
Field				
P018	SEC-FS-1	4/13/2011	4/20/2011	0.162
P028	SEC-FS-2	4/13/2011	4/21/2011	0.127
P038	SEC-FS-3	4/14/2011	4/22/2011	0.371
P048	SEC-FS-4	4/14/2011	4/25/2011	0.170
Trip				
P050	Trip Spike 1	4/15/2011	4/20/2011	0.121
P051	Trip Spike 2	4/15/2011	4/21/2011	0.115
P052	Trip Spike 3	4/15/2011	4/22/2011	0.129
P053	Trip Spike 4	4/15/2011	4/25/2011	0.123
Lab				
-	Lab Spike 1	-	4/18/2011	0.126
-	Lab Spike 2	-	4/22/2011	0.133

Notes:
Spikes were at 0.15 µg/ml.

Appendix A:

Standard Operating Procedure for Chlorthal

California Environmental Protection Agency

Air Resources Board

Standard Operating Procedure
Air Sampling and Analysis of Dimethyl-2,3,5,6-Tetrachloroterephthalate (Chlorthal)

Special Analysis Section
Northern Laboratory Branch
Monitoring and Laboratory Division

September 15, 2010

Version 1

Approved by:

Russell Grace, Manager
Special Analysis Section

DISCLAIMER: Mention of any trade name or commercial product does not constitute endorsement or recommendation of this product by the Air Resources Board. Specific brand names and instrument descriptions listed are equipment used by the ARB laboratory. Any functionally equivalent instrumentation can be used.

1. SCOPE

This is a gas chromatography/electron capture detector (GC/ECD) method for the determination of chlorthal in ambient and application air sampling.

2. SUMMARY OF METHOD

Ambient and application air samples are collected on XAD-2 sorbent tubes. Sampled tubes are stored at four (4) degrees centigrade (°C) or lower prior to extraction. Sample tubes are extracted using pesticide grade ethyl acetate. Sample analysis is performed using a GC/ECD. Sample analysis and quantitation uses external standard method for instrument calibration. Estimated quantitation level (EQL) for this method is approximately 0.1 micrograms per cubic meter ($\mu g/m^3$) prior to any sample dilution.

3. INTERFERENCES / LIMITATIONS

Method interference may be caused by contaminants in solvents, reagents, glassware and the XAD-2 tubes that can lead to discrete artifacts or elevated baselines. Analysis of samples containing high concentrations of early eluting components may cause significant contamination of the analytical equipment. Both a system blank and method blank must be analyzed with each batch of samples to detect any possible method or instrument interference.

4. EQUIPMENT AND CONDITIONS

A. Instrumentation

- Agilent Technologies 7890A Series gas chromatograph with Agilent Model 7693 injector.
- Column: Agilent HP-5, 30 meter, 0.32mm I.D., 0.25 micron film thickness, with helium as carrier gas at constant flow and nitrogen as the makeup gas at 25 ml/min.
- GC temperature program: initial 100° C, initial time 2 minutes, to 300° C @ 12° C/min, hold 2 minutes.
- Inlet temperature 260° C; splitless.
- Detector temperature 325° C.

B. Auxiliary Apparatus

- XAD-2 tubes (400/200 mg) (SKC cat # 226-30-6) or equivalent
- Glass amber vials, 2-ml capacity with septum caps.

C. Reagents

- Ethyl Acetate(EtAc) (B&J brand HPLC grade or equivalent)
- Chlorthal (CAS#1861-32-1) 99.2%, Chem Services PS-33

5. SAMPLE COLLECTION

a) Samples are collected in the field with a maximum flow rate of three (3) liters per minute (Lpm).
b) After collection the samples are placed in a glass tube and stored in a cooler at 4° C or less until returned to the laboratory.
c) Samples are stored in the laboratory at 4° C or less until ready for analysis.

6. SAMPLE EXTRACTON

a) Prepare a method blank and laboratory control sample (LCS) tube with every batch of field samples not to exceed twenty (20) samples in an analytical batch. The LCS is spiked with 0.6 µg of chlorthal before extraction.
b) Carefully score and break the sample XAD-2 tube just in front of the glass wool plug on the primary section.
c) Remove the glass wool plug using forceps. Pour the XAD-2 resin from the primary section into an 8 ml glass vial.
d) Score the tube just in front of the secondary section glass wool. Retain the secondary section for later analysis to check for breakthrough.
e) Using three (3.0) ml of EtAc carefully rinse the inside of the primary section into the glass vial. Cap securely.
f) The extracts are allowed to sit at room temperature for 1 hour. The extracts are ready for analysis or if not analyzed are stored in a refrigerator at 4º C.

7. ANALYSIS OF SAMPLES

a) Transfer approximately 0.25 ml of the sample extract into a 1.5-ml autosampler vial equipped with a 0.25 ml insert. Sample extract is now ready for analysis.
b) A 1-µl injection volume will be used for all analyses.
c) Perform a calibration curve using concentrations at or near the EQL to approximately 10 times higher. At least five (5) points must be analyzed to establish a calibration curve. The concentrations should encompass the expected levels of the analyte.
d) Prepare a sample sequence for the GC/ECD. The sequence should include a system blank and a calibration control standard, for every ten (10) samples analyzed. If this batch of samples includes a method blank and /or LCS, they should be run prior to field samples to verify that QC criteria have been met.

e) Because of the nature of the XAD-2 tube, extraneous components will be extracted along with the analytes of interest. To minimize excessive carry over of these contaminants from one analysis to the next, a system blank should be run after every ten (10) to twenty (20) samples or more frequently if indicated by sample chromatograms. In no case should a sample contaminant interfere with the peaks of interest. This will be verified by the absence of a peak in the analyte retention time window during the system blank analysis.

f) Review and edit the quantitation reports as needed.

g) The samples must be diluted if the analytical results are not within the calibration curve. Every attempt should be made to have the diluted results fall within the upper half of the calibration curve.

h) The final results will be adjusted by an appropriate dilution factor and reported in µg/ml.

i) The atmospheric concentration is calculated according to:

$$\text{Ambient Sample Conc. } (\mu g/m^3) = \frac{\text{Extract Conc. } (\mu g/ml) \times 3 \text{ ml}}{\text{Air Volume Sampled } (m^3)}$$

j) Given instrument sensitivity and a maximum sample volume of 4.32 m^3 the EQL for this method will be approximately 0.10 $\mu g/m^3$.

8. QUALITY ASSURANCE

a) A system blank must be analyzed with each batch of samples. The system blank is an aliquot of the solvent used to extract the samples. The analyte concentration must be below the method detection limit (MDL) established for the method. A system blank is run at the beginning of the analytical batch, after the calibration curve, or just prior to sample analysis.

b) A minimum five point calibration will be run with each sample batch.

c) A calibration control will be run after the calibration, every tenth sample and at the end of the sample batch to verify system linearity. The calibration control values must be within 25% of the actual value.

d) A method blank will be run with each sample batch. The method blank is a blank solvent that is run through the entire method. The analyte concentration must be below the MDL established for the method.

e) A LCS will be run with every sample batch. The LCS analyte concentration should fall within the lower half of the calibration curve. The LCS stock standard should come from a different source or lot than the daily calibration standards. If not available then this should be prepared separately from the calibration curve. The analytical value of the LCS must be within three standard deviations of its historical mean. If the LCS is outside these limits then the samples in the analytical batch must be reanalyzed.

f) Run specific quality control samples, such as field spikes, trip spikes, and laboratory spikes prior to the field samples. A system blank should be run after the spiked samples to ensure that spiked analyte does not carry over.

9. Safety

This procedure does not address all of the safety concerns associated with chemical analysis. It is the responsibility of the analyst to establish appropriate safety and health practices. For hazard information and guidance refer to the material safety data sheets (MSDS) of any chemicals used in this procedure.

APPENDIX E

XAD2 Sample Field Log Sheets

XAD-2 RESIN SORBENT TUBE FIELD LOG SHEET

Project: DCPA Pesticide Application Air Monitoring

Start Flow Set: 3.0 ±0.1 lpm End Flow Criteria: 3.0 lpm ±20%

Log #	Sample Name	Sampler ID Number	Date & Time Entry Example (6/14/08 13:42)		Elapsed Time Meter (ETM)		ETM TOTAL	Mass Flow Meter Display		Corrected Average Flow	Comment Number	Weather K,P,C,F&R		Initials	
			Start	End	Start	End	MIN	Start	End			Start	End	Start	End
001	BKG-NEC	4671	4/12/11 14:54	4/13/11 7:32	648.0	664.6	996.0	2.85	2.89	3.02		K	K	SA	SA
002	BKG-N	3021	4/12/11 15:11	4/13/11 7:41	1330.1	1346.5	984.0	2.85	2.93	3.04		K	K	SA	SA
003	BKG-NWC	3007	4/12/11 15:29	4/13/11 7:53	649.7	665.7	960.0	2.85	0.55	1.81		K	K	SA	SA
004	BKG-WM	34	4/12/11 15:47	4/13/11 8:02	463.7	480.0	978.0	2.85	2.9	3.02		K	K	SA	SA
005	BKG-SWC	4660	4/12/11 15:55	4/13/11 8:10	597.0	613.3	978.0	2.85	2.86	3.00		K	K	SA	SA
006	BKG-S	4652	4/12/11 16:15	4/13/11 8:20	203.5	219.6	966.0	2.85	3	3.07		K	K	SA	SA
007	BGK-SEC	4677	4/12/11 16:28	4/13/11 8:28	802.9	818.9	960.0	2.85	2.93	3.04		K	K	SA	SA
008	BGK-C-SEC	2981	4/12/11 16:28	4/13/11 8:28	746.6	762.8	972.0	2.85	3.08	3.11		K	K	SA	SA
009	BGK-EM	4667	4/12/11 16:37	4/13/11 8:38	690.0	706.0	960.0	2.85	3	3.07		K	K	SA	SA
010	NEC-1	4671	4/13/11 8:51	4/13/11 18:16	664.7	674.1	564.0	2.85	2.83	2.99	1	K	K	SA	SA
011	N-1	3021	4/13/11 8:48	4/13/11 18:21	1346.5	1356.1	576.0	2.85	2.83	2.99		K	K	SA	SA
012	NWC-1	3007	4/13/11 8:52	4/13/11 18:30	665.7	675.5	588.0	2.85	2.81	2.98		K	K	SA	SA
013	WM-1	34	4/13/11 8:53	4/13/11 18:40	480.0	489.8	588.0	2.85	2.82	2.98		K	K	SA	SA
014	SWC-1	4660	4/13/11 8:54	4/13/11 18:46	613.3	623.2	594.0	2.85	2.83	2.99		K	K	SA	SA
015	S-1	4652	4/13/11 8:37	4/13/11 19:00	219.6	230.0	624.0	2.85	2.85	3.00		K	K	SA	SA
016	SEC-1	4677	4/13/11 8:28	4/13/11 19:04	818.9	829.3	624.0	2.85	2.82	2.98		K	K	SA	SA
017	SEC-C-1	2981	4/13/11 8:28	4/13/11 19:06	762.8	773.2	624.0	2.85	2.85	3.00		K	K	SA	SA
018	SEC-FS-1	4663	4/13/11 8:33	4/13/11 19:08	831.0	841.5	630.0	2.85	2.84	2.99		K	K	SA	SA
019	EM-1	4667	4/13/11 8:38	4/13/11 19:14	706.0	716.6	636.0	2.85	2.64	2.89	2	K	K	SA	SA
020	NEC-2	4671	4/13/11 18:16	4/14/11 7:35	674.1	687.4	798.0	2.85	2.68	2.91		K	K	SA	SA
021	N-2	3021	4/13/11 19:27	4/14/11 7:42	1356.1	1369.4	798.0	2.85	2.74	2.94		K	K	SA	SA

MFM Used #: 105898 **Slope:** 1.032 **Intercept:** 0.055

Weather Codes: K = Clear, P = Partly Cloudy, C = ≥67% Cloudy, F = Fog and R = Rain (any)

1. Application 2 lbs/acre Started at 09:15
2. Application Ended at 11:21

XAD-2 RESIN SORBENT TUBE FIELD LOG SHEET

Project: DCPA Pesticide Application Air Monitoring

Start Flow Set: 3.0 ±0.1 lpm End Flow Criteria: 3.0 lpm ±20%

Log #	Sample Name	Sampler ID Number	Date & Time Entry Example (6/14/08 13:42) Start	Date & Time End	Elapsed Time Meter (ETM) Start	Elapsed Time Meter (ETM) End	ETM TOTAL MIN	Mass Flow Meter Display Start	Mass Flow Meter Display End	Corrected Average Flow	Comment Number	Weather K,P,C,F&R Start	Weather End	Initials Start	Initials End
022	NWC-2	3007	4/13/11 18:30	4/14/11 7:53	675.5	688.8	798.0	2.85	2.92	3.03		K	K	SA	SA
023	WM-2	34	4/13/11 18:40	4/14/11 8:04	489.8	503.2	804.0	2.85	2.71	2.92		K	K	SA	SA
024	SWC-2	4660	4/13/11 18:46	4/14/11 8:11	623.2	636.6	804.0	2.85	2.77	2.95		K	K	SA	SA
025	S-2	4652	4/13/11 20:00	4/14/11 8:24	230.0	243.4	804.0	2.85	2.75	2.94		K	K	SA	SA
026	SEC-2	4677	4/13/11 19:04	4/14/11 8:31	829.5	843.0	810.0	2.85	2.71	2.92		K	K	SA	SA
027	SEC-C-2	2981	4/13/11 19:06	4/14/11 8:34	773.2	786.7	810.0	2.85	2.62	2.88		K	K	SA	SA
028	SEC-FS-2	4663	4/13/11 19:08	4/14/11 8:38	841.5	855.0	810.0	2.85	2.69	2.91		K	K	SA	SA
029	EM-2	4667	4/13/11 19:14	4/14/11 8:43	716.6	730.1	810.0	2.85	2.64	2.89		K	K	SA	SA
030	NEC-3	4671	4/14/11 7:35	4/14/11 18:12	687.4	698.0	636.0	2.85	2.95	3.05		K	K	SA	SA
031	N-3	3021	4/14/11 7:42	4/14/11 18:16	1369.4	1380.1	642.0	2.85	3	3.07		K	K	SA	SA
032	NWC-3	3007	4/14/11 7:53	4/14/11 18:31	688.8	699.4	636.0	2.85	2.72	2.93		K	K	SA	SA
033	WM-3	34	4/14/11 8:04	4/14/11 18:37	503.2	513.7	630.0	2.85	2.92	3.03		K	K	SA	SA
034	SWC-3	4660	4/14/11 8:11	4/14/11 18:43	636.6	647.1	630.0	2.85	2.83	2.99		K	K	SA	SA
035	S-3	4652	4/14/11 8:24	4/14/11 18:53	243.4	253.9	630.0	2.85	2.9	3.02		K	K	SA	SA
036	SEC-3	4677	4/14/11 8:31	4/14/11 19:00	843.0	853.4	624.0	2.85	2.48	2.81		K	K	SA	SA
037	SEC-C-3	2981	4/14/11 8:34	4/14/11 19:03	786.7	797.2	630.0	2.85	3.03	3.09		K	K	SA	SA
038	SEC-FS-3	4663	4/14/11 8:38	4/14/11 19:06	855.0	865.5	630.0	2.85	3.3	3.23		K	K	SA	SA
039	EM-3	4667	4/14/11 8:43	4/14/11 19:11	730.1	740.6	630.0	2.85	2.79	2.97		K	K	SA	SA
040	NEC-4	4671	4/14/11 18:12	4/15/11 8:00	698.0	711.8	828.0	2.85	2.87	3.01		K	K	SA	SA
041	N-4	3021	4/14/11 18:16	4/15/11 8:02	1380.1	1393.8	822.0	2.85	2.86	3.00		K	K	SA	SA
042	NWC-4	3007	4/14/11 18:31	4/15/11 8:27	699.4	713.4	840.0	2.85	2.85	3.00		K	K	SA	SA

MFM Used #: **105898** **Slope:** **1.032** **Intercept:** **0.055**

Weather Codes: K = Clear, P = Partly Cloudy, C = ≥67% Cloudy, F = Fog and R = Rain (any)

XAD-2 RESIN SORBENT TUBE FIELD LOG SHEET

Project: DCPA Pesticide Application Air Monitoring

Start Flow Set: 3.0 ±0.1 lpm End Flow Criteria: 3.0 lpm ±20%

Log #	Sample Name	Sampler ID Number	Date & Time Entry Example (6/14/08 13:42)		Elapsed Time Meter (ETM)		ETM TOTAL MIN	Mass Flow Meter Display		Corrected Average Flow	Comment Number	Weather K,P,C,F&R		Initials	
			Start	End	Start	End		Start	End			Start	End	Start	End
043	WM-4	34	4/14/11 18:37	4/15/11 8:34	513.7	527.6	834.0	2.85	2.87	3.01		K	K	SA	SA
044	SWC-4	4660	4/14/11 18:43	4/15/11 8:39	647.1	661.0	834.0	2.85	2.84	2.99		K	K	SA	SA
045	S-4	4652	4/14/11 18:53	4/15/11 8:50	253.9	267.9	840.0	2.85	2.83	2.99		K	K	SA	SA
046	SEC-4	4677	4/14/11 19:00	4/15/11 8:56	853.4	867.4	840.0	2.85	2.77	2.95		K	K	SA	SA
047	SEC-C-4	2981	4/14/11 19:03	4/15/11 8:58	797.2	811.1	834.0	2.85	2.84	2.99		K	K	SA	SA
048	SEC-FS-4	4663	4/14/11 19:06	4/15/11 9:00	865.5	879.4	834.0	2.85	2.92	3.03		K	K	SA	SA
049	EM-4	4667	4/14/11 19:11	4/15/11 9:05	740.6	754.4	828.0	2.85	2.73	2.93		K	K	SA	SA
050	TRIP SPIKE-1		4/15/11 9:32	4/15/11 15:02			0.0					K	K	SA	SA
051	TRIP SPIKE-2		4/15/11 9:35	4/15/11 15:02			0.0					K	K	SA	SA
052	TRIP SPIKE-3		4/15/11 9:37	4/15/11 15:02			0.0					K	K	SA	SA
053	TRIP SPIKE-4		4/15/11 9:39	4/15/11 15:02			0.0					K	K	SA	SA
							0.0					K	K	SA	SA
							0.0					K	K	SA	SA
							0.0					K	K	SA	SA
							0.0					K	K	SA	SA
							0.0					K	K	SA	SA
							0.0					K	K	SA	SA
							0.0					K	K	SA	SA
							0.0					K	K	SA	SA
							0.0					K	K	SA	SA
							0.0					K	K	SA	SA

MFM Used #: 105898 **Slope:** 1.032 **Intercept:** 0.055

Weather Codes: K = Clear, P = Partly Cloudy, C = ≥67% Cloudy, F = Fog and R = Rain (any)

APPENDIX F

Calibration/Certification Report

CALIFORNIA AIR RESOURCES BOARD

FLOW CALIBRATION REPORT

TO: *SPECIAL PURPOSE MONITORING*
STEVE RIDER

LOG NUMBER : *2010 175*

FROM: ROBERT RUSSELL\BRIAN SPREADBOROUGH
Program Evaluation & Standards

CALIBRATION DATE: *08/05/2010*
REPORT DATE : *08/05/2010*

IDENTIFICATION

Instrument : *AALBORG GFM17*
Position number : *1*
Property No. : 105898
Serial No. : *228248-1*
Previous Log No.: *N/A*
Bar Code No. : *105898*
Elevation : *25.00'*
Inst. Prop. Of : *SPECIAL PURPOSE MONITORING AND SUPPORT*

Site Name : *MLD Standards Lab*
Site Number : *34-299*
Location : *1309 T-Street*
Sacramento, CA 95814

CALIBRATION STANDARDS	ID NUMBER
Molbox	105898

CALIBRATION RESULTS

Component	FLOW
Instrument Range	0-5SLM
Initial Zero Setting	
Initial Span Setting	
Final Zero Setting	
Final Span Setting	
Slope	0.969
Intercept	-0.054
Correlation Coefficient	0.99994
Change From Previous Calibration (%)	N/A
Date Of Last Calibration	N/A

Calibration Equation:

Calibration Expires: *08/05/2011*

Std. FLOW = 1.032 * (Net Display) + 0.055

Comments:

CALIBRATED BY: NBS

CHECKED BY: R Russell

APPENDIX G

Meteorological Data

Report for 4/12/2011 - Day 102 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg
13:50	0.5	63.7	17.6	41.3	761.1	0.009	0.009	0.01	0	0
13:55	0.5	63.7	17.27	42.1	761.2	0.024	0.023	0.023	0	0
14:00	2.9	78.8	17.05	43	761.3	0.038	0.035	0.035	0	37.7
14:05	0.63	106.4	5.39	43.3	761.3	0.043	0.04	0.04	0	5.1
14:10	0.52	8.1	-72.62	131.7	761.3	1.198	1.189	1.184	0	83.8
14:15	0.5	272.6	-72.62	128.8	761.3	1.241	1.208	1.147	0	7.9
14:20	0.54	293	-41.8	51.7	761.2	0.378	0.371	0.333	0	12
14:25	0.54	282.7	14.54	53.7	761.2	0.153	0.145	0.133	0	19.3
14:30	8.55	298.3	14.54	53.8	761.2	0.095	0.087	0.085	0	12.3
14:35	12.58	286.8	14.54	53.1	761.1	0.081	0.074	0.074	0	14
14:40	12.92	292.8	14.32	53.3	761	0.076	0.071	0.072	0	9.7
14:45	13.01	288.4	14.26	53.3	761	0.077	0.07	0.071	0	11.3
14:50	13.56	295.4	13.93	53.2	760.9	0.076	0.07	0.071	0	13.2
14:55	12.84	282.3	13.88	54.5	760.9	0.074	0.068	0.069	0	8.6
15:00	11.99	287.2	13.99	54.8	760.9	0.073	0.067	0.068	0	13.5
15:05	12.82	284	14.1	54	760.9	0.07	0.064	0.065	0	13.1
15:10	13.64	282.1	13.99	54.5	761	0.068	0.063	0.064	0	14.8
15:15	12.84	274.7	14.04	54.5	761	0.065	0.06	0.061	0	13.5
15:20	14.09	283.2	13.99	54.5	761.1	0.064	0.059	0.06	0	8.1
15:25	14.19	282.5	13.82	55.3	761.1	0.063	0.057	0.059	0	10.3
15:30	13.6	293.2	13.6	55.3	761.1	0.062	0.057	0.059	0	9.3
15:35	13.85	286	13.5	55.8	761.2	0.062	0.057	0.058	0	10.8
15:40	12.75	288	13.5	56.5	761.2	0.06	0.056	0.057	0	10.6
15:45	14.3	293.6	13.44	57	761.2	0.06	0.056	0.057	0	11.9
15:50	13.64	284	13.44	57.6	761.2	0.06	0.055	0.056	0	9.2
15:55	13.81	285.7	13.44	56.7	761.3	0.059	0.054	0.055	0	9.5
16:00	14.21	286.6	13.39	56.3	761.3	0.059	0.053	0.055	0	7.2
16:05	13.88	282.7	13.39	55	761.3	0.062	0.053	0.054	0	9.7
16:10	12.12	285.6	13.33	55.9	761.3	0.061	0.053	0.054	0	12.1
16:15	14	290.2	13.17	56.8	761.3	0.062	0.053	0.055	0	13.1
16:20	13.05	283.7	13.06	57.4	761.3	0.061	0.053	0.054	0	7.7
16:25	12.92	290.2	13.11	59.1	761.3	0.061	0.054	0.055	0	9.6
16:30	13.62	285.6	12.95	58.7	761.3	0.062	0.054	0.056	0	8.1
16:35	13.54	285.4	12.89	60	761.3	0.062	0.054	0.056	0	11.7
16:40	14.45	289.5	12.84	58.6	761.3	0.062	0.055	0.057	0	6.2
16:45	12.35	295.4	12.62	60.5	761.3	0.063	0.056	0.057	0	7.4
16:50	12.6	284.3	12.51	62	761.3	0.064	0.057	0.058	0	8
16:55	13.85	295.4	12.51	60.8	761.2	0.065	0.057	0.059	0	8.1
17:00	14.34	277.5	12.4	61.1	761.3	0.065	0.058	0.059	0	8.1
17:05	12.9	281.3	12.46	61.4	761.2	0.065	0.058	0.059	0	8.6
17:10	13.64	287	12.46	60.8	761.2	0.066	0.059	0.06	0	7.5

17:15	13.01	288.2	12.29	61.4	761.2	0.067	0.06	0.061	0	7.5
17:20	14.13	282.5	12.29	61	761.2	0.068	0.06	0.062	0	5.9
17:25	14.02	280.4	12.18	61.5	761.2	0.068	0.061	0.062	0	6.2
17:30	13.96	284	12.07	62.8	761.2	0.07	0.062	0.063	0	5.8

Report for 4/12/2011 - Day 102 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg
17:35	13.56	277.3	11.96	63.2	761.1	0.071	0.063	0.065	0	8.6
17:40	13.26	271.2	11.85	62.9	761.1	0.071	0.064	0.065	0	6.3
17:45	13.41	265.2	11.8	63.3	761	0.072	0.065	0.065	0	5.7
17:50	14.53	278.8	11.69	64	761	0.073	0.066	0.067	0	6.4
17:55	14.07	276.7	11.52	65	761	0.076	0.068	0.069	0	6.9
18:00	13.07	283.6	11.36	66.2	760.9	0.078	0.07	0.071	0	6.7
18:05	11.46	276.1	11.31	66.8	760.9	0.079	0.072	0.073	0	6.8
18:10	13.96	273.1	11.2	66.7	760.8	0.081	0.073	0.074	0	5.9
18:15	12.84	273	11.03	66.8	760.8	0.082	0.074	0.076	0	7.2
18:20	12.31	272.8	10.92	67.8	760.8	0.084	0.076	0.078	0	5.4
18:25	12.18	271.4	10.81	67.9	760.7	0.086	0.078	0.079	0	5.8
18:30	11.18	269.6	10.7	68.6	760.7	0.088	0.08	0.081	0	7.4
18:35	9.87	265.9	10.59	68.7	760.6	0.089	0.082	0.082	0	6
18:40	11.25	265.3	10.43	68.9	760.6	0.091	0.084	0.084	0	7.4
18:45	10.25	266.7	10.38	69.3	760.5	0.093	0.085	0.086	0	6.8
18:50	10	267.7	10.27	69.8	760.5	0.095	0.087	0.088	0	5.9
18:55	8.55	264.8	10.16	69.9	760.5	0.097	0.089	0.09	0	6.4
19:00	9.38	264.1	10.1	70.5	760.4	0.099	0.091	0.092	0	5.7
19:05	9.7	266.5	9.99	70.5	760.4	0.101	0.093	0.093	0	6.7
19:10	8.94	265.5	9.94	70.8	760.4	0.103	0.095	0.095	0	6.7
19:15	9.42	265	9.88	71.4	760.4	0.104	0.096	0.097	0	6
19:20	9.57	262.9	9.83	71.4	760.3	0.107	0.098	0.099	0	7.2
19:25	10.95	263.1	9.77	71.1	760.3	0.108	0.1	0.1	0	6.1
19:30	9.53	264.2	9.77	70.7	760.3	0.11	0.101	0.101	0	6.2
19:35	9.85	262	9.72	70.5	760.2	0.111	0.103	0.103	0	6.7
19:40	9.61	260.3	9.61	70.6	760.2	0.112	0.104	0.104	0	6.3
19:45	9.49	258.2	9.55	71	760.2	0.113	0.105	0.105	0	5.9
19:50	9.83	257.3	9.55	71.4	760.2	0.114	0.106	0.106	0	5.9
19:55	9.87	255.5	9.5	71.6	760.2	0.115	0.107	0.107	0	6.2
20:00	9.76	253.4	9.5	71.7	760.1	0.117	0.108	0.108	0	5.6
20:05	9.93	253.5	9.44	71.6	760.1	0.117	0.109	0.109	0	6.2
20:10	9.95	255.6	9.44	71.9	760.1	0.118	0.11	0.11	0	4.9
20:15	8.85	256.3	9.39	72.1	760.1	0.12	0.111	0.111	0	5.7
20:20	9.78	253.6	9.33	72.4	760.1	0.12	0.112	0.112	0	6.1
20:25	9.3	255.9	9.33	72.4	760.1	0.121	0.114	0.113	0	5.1

20:30	9.87	253.6	9.33	72.3	760.1	0.122	0.114	0.114	0	5
20:35	9.87	256.6	9.33	72.6	760.1	0.123	0.115	0.115	0	5.6
20:40	10.12	254.2	9.33	72.6	760.1	0.124	0.116	0.116	0	5.2
20:45	10.23	257.4	9.33	72.8	760.2	0.125	0.117	0.117	0	5.4
20:50	9.34	252.4	9.33	72.6	760.2	0.126	0.118	0.117	0	5.9
20:55	9.59	254.9	9.33	72.6	760.2	0.126	0.118	0.118	0	5.6
21:00	10.76	254.3	9.33	72.8	760.2	0.127	0.119	0.119	0	5.7
21:05	11.78	249.2	9.39	72.8	760.2	0.127	0.12	0.119	0	5.1
21:10	11.48	245.3	9.39	72.5	760.2	0.127	0.119	0.119	0	4.9
21:15	12.67	242.3	9.44	72.5	760.2	0.126	0.119	0.118	0	4.9

Report for 4/12/2011 - Day 102 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg

21:20	11.35	245.3	9.5	72.3	760.2	0.126	0.119	0.118	0	5.2
21:25	9.87	239.9	9.44	72.4	760.2	0.126	0.119	0.118	0	5.9
21:30	11.27	244	9.44	72.5	760.3	0.126	0.119	0.118	0	6.2
21:35	10.21	250.8	9.5	72.5	760.3	0.128	0.12	0.119	0	6.1
21:40	8.81	252.4	9.5	72.6	760.3	0.128	0.121	0.12	0	7.2
21:45	7.58	254.2	9.44	73	760.3	0.129	0.122	0.121	0	5.6
21:50	7.58	258.9	9.39	73.4	760.2	0.13	0.123	0.122	0	6.1
21:55	10.89	253.3	9.39	73.2	760.2	0.131	0.123	0.123	0	6.9
22:00	12.09	251.2	9.39	73	760.2	0.131	0.123	0.123	0	5.7
22:05	12.45	249.9	9.39	73	760.2	0.13	0.123	0.122	0	5.9
22:10	11.52	253.1	9.33	72.6	760.2	0.131	0.123	0.122	0	5.3
22:15	11.25	250.7	9.23	72.5	760.2	0.131	0.123	0.123	0	5.6
22:20	11.9	252	9.12	72.9	760.2	0.131	0.123	0.123	0	5.3
22:25	10.74	254.3	9.01	73.3	760.2	0.131	0.124	0.123	0	5.2
22:30	10.19	254.5	8.95	73.6	760.2	0.132	0.125	0.124	0	4.8
22:35	10.34	254.4	8.9	73.9	760.2	0.132	0.125	0.125	0	4.7
22:40	9.42	255.3	8.84	73.9	760.2	0.133	0.126	0.125	0	4.6
22:45	9.21	254.9	8.79	74.1	760.1	0.134	0.126	0.126	0	4.7
22:50	8.89	255.7	8.73	74.1	760.1	0.134	0.127	0.126	0	5
22:55	8.51	257.1	8.68	74.3	760.1	0.135	0.128	0.127	0	5.2
23:00	8.89	256.9	8.62	74.5	760.1	0.136	0.128	0.128	0	4.9
23:05	9.42	258	8.57	74.8	760.1	0.137	0.129	0.129	0	4.7
23:10	9.93	259.4	8.57	74.8	760.1	0.137	0.13	0.129	0	4.9
23:15	9.23	259.9	8.62	74.4	760.2	0.138	0.131	0.13	0	4.8
23:20	8.05	261.9	8.57	74.3	760.2	0.139	0.132	0.131	0	5.2
23:25	8.81	257.4	8.51	74.4	760.2	0.139	0.132	0.131	0	4.3
23:30	9.06	259.2	8.46	74.7	760.2	0.14	0.132	0.132	0	4.7
23:35	8.22	261.3	8.46	74.8	760.2	0.14	0.134	0.132	0	4.6
23:40	8.45	261.2	8.4	74.8	760.2	0.142	0.134	0.133	0	4.5

23:45	8.26	264.1	8.35	75	760.2	0.142	0.135	0.134	0	5.1
23:50	7.9	261.6	8.29	75.2	760.2	0.143	0.136	0.135	0	5.1
23:55	7.47	260.4	8.24	75.3	760.2	0.143	0.137	0.136	0	5

Totals	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
Savg	10.58	260.2	9.16	66.9	760.6	0.119	0.112	0.111	n/a
Vavg	0	269.5	0	0	0	0	0	0	n/a

Data Recover 42.4 %

Report for 4/13/2011 - Day 103 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg
0:00	7.18	262.3	8.19	75.6	760.2	0.144	0.137	0.136	0	4
0:05	6.92	261.5	8.13	75.7	760.2	0.145	0.138	0.137	0	4
0:10	7.3	263	8.08	75.9	760.2	0.146	0.139	0.138	0	4.4
0:15	7.71	264.2	8.08	76.2	760.2	0.147	0.14	0.139	0	3.8
0:20	7.73	263.6	8.08	76.1	760.2	0.148	0.141	0.14	0	4.2
0:25	8.05	261.2	8.08	76.3	760.2	0.149	0.142	0.14	0	3.9
0:30	7.66	257.7	8.08	76.2	760.2	0.149	0.142	0.14	0	4.2
0:35	8.55	256.2	8.13	76.3	760.2	0.149	0.142	0.141	0	4.8
0:40	8.39	258	8.24	76.3	760.2	0.149	0.142	0.141	0	4.4
0:45	8.32	259.4	8.4	75.8	760.2	0.15	0.143	0.141	0	4.8
0:50	8.6	264.6	8.62	75.2	760.2	0.15	0.143	0.142	0	5
0:55	8.26	266.1	8.79	74.5	760.2	0.15	0.143	0.142	0	4.7
1:00	8.68	270.9	8.95	73.6	760.2	0.151	0.144	0.142	0	5.2
1:05	8.13	272.9	9.01	73.3	760.2	0.151	0.144	0.142	0	4.8
1:10	8.6	274.5	9.06	73.1	760.2	0.151	0.144	0.142	0	5
1:15	7.71	278	9.01	73.1	760.2	0.151	0.143	0.142	0	4.8
1:20	6.65	279.8	9.06	73.4	760.2	0.151	0.143	0.142	0	4.5
1:25	6.63	281.7	9.01	73.6	760.2	0.15	0.143	0.142	0	5.1
1:30	7.22	285.5	9.01	73.6	760.3	0.15	0.143	0.142	0	5.2
1:35	7.2	284.9	9.01	73.6	760.3	0.15	0.143	0.142	0	4.5
1:40	7.13	288.3	9.01	73.8	760.3	0.15	0.143	0.142	0	4.8
1:45	6.56	286.3	9.01	73.9	760.3	0.15	0.143	0.142	0	5.2
1:50	6.27	285.9	9.06	74.1	760.3	0.15	0.142	0.141	0	4.1
1:55	5.67	287.3	9.06	74.2	760.4	0.149	0.142	0.14	0	6.2
2:00	5.5	296.8	9.06	73.9	760.3	0.15	0.142	0.141	0	7.6
2:05	5.93	302	9.17	72.7	760.2	0.15	0.143	0.142	0	4.8
2:10	4.63	303	9.12	73	760.3	0.151	0.143	0.142	0	6
2:15	4.23	300.5	8.9	73.6	760.3	0.151	0.143	0.142	0	4.2

2:20	4.32	299.9	8.62	74.3	760.3	0.151	0.143	0.142	0	4.3
2:25	3.7	297.8	8.46	75.2	760.3	0.151	0.144	0.143	0	6.6
2:30	2.56	302.2	8.29	75.3	760.3	0.151	0.144	0.143	0	15.2
2:35	2.87	319.8	8.08	76.6	760.3	0.154	0.147	0.147	0	5.9
2:40	3.62	324	7.97	77.5	760.4	0.158	0.151	0.15	0	5.5
2:45	3.85	352.8	8.08	78.5	760.4	0.158	0.151	0.15	0	16.7
2:50	3.21	14.2	8.19	79.1	760.3	0.128	0.122	0.12	0	6.6
2:55	3.15	10.4	8.19	79	760.3	0.102	0.096	0.094	0	5.5
3:00	3.26	16	8.02	80	760.3	0.092	0.086	0.085	0	7.2
3:05	2.73	13.3	7.91	80.8	760.3	0.089	0.084	0.083	0	2.8
3:10	2.47	11.8	7.8	81.4	760.3	0.089	0.083	0.082	0	2.8
3:15	2.28	359.6	7.75	81.9	760.3	0.092	0.087	0.086	0	5.2
3:20	2.49	357.9	7.69	82.2	760.3	0.107	0.101	0.101	0	6.2
3:25	2.87	346.3	7.75	82.1	760.3	0.138	0.131	0.132	0	3.9
3:30	3.26	340.6	7.8	81.8	760.3	0.163	0.156	0.156	0	3.3
3:35	3.59	328.3	7.86	81.7	760.3	0.173	0.166	0.165	0	3.2
3:40	3.13	327.7	7.86	81.7	760.3	0.176	0.169	0.168	0	3.4

Report for 4/13/2011 - Day 103 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg

3:45	2.79	340.9	7.91	81.7	760.3	0.179	0.172	0.17	0	3.5
3:50	2.75	341	7.91	81.7	760.2	0.183	0.176	0.173	0	4.7
3:55	1.9	324.8	7.86	81.4	760.2	0.184	0.177	0.175	0	14.8
4:00	1.5	308.7	7.8	82	760.2	0.181	0.175	0.172	0	12.9
4:05	1.31	323.2	7.47	83	760.2	0.179	0.173	0.17	0	8.7
4:10	1.37	339.8	7.15	83.9	760.2	0.182	0.176	0.173	0	7.3
4:15	1.07	0	6.98	84.9	760.2	0.173	0.166	0.164	0	7.1
4:20	1.71	4.5	6.82	85.6	760.2	0.148	0.142	0.139	0	6.3
4:25	2.03	16.7	6.76	86.5	760.2	0.123	0.117	0.114	0	3.9
4:30	2	13.1	6.76	86.6	760.2	0.111	0.104	0.103	0	9
4:35	2.3	7	6.71	86.3	760.2	0.111	0.104	0.103	0	7.4
4:40	2.49	16	6.6	86.3	760.2	0.107	0.101	0.1	0	4.9
4:45	2.11	6.9	6.6	86.3	760.2	0.104	0.099	0.098	0	12
4:50	1.98	11.5	6.65	86	760.2	0.114	0.107	0.107	0	6.8
4:55	1.92	42.2	6.65	85.2	760.2	0.11	0.104	0.103	0	20.6
5:00	2.07	78.8	6.6	84.7	760.1	0.113	0.107	0.106	0	4.9
5:05	2.13	86.2	6.49	84.5	760.1	0.118	0.112	0.111	0	6.7
5:10	1.79	102.9	6.32	85.1	760.1	0.122	0.116	0.115	0	3.8
5:15	1.98	112.9	6.38	86.6	760.1	0.126	0.12	0.119	0	4.6
5:20	3.11	111.2	6.49	85.8	760.1	0.13	0.124	0.123	0	4.7
5:25	2.92	113.7	6.27	83.1	760.1	0.131	0.125	0.123	0	4.4
5:30	3.3	105	6.16	84.9	760.2	0.131	0.125	0.123	0	3.9

5:35	3.09	98.2	6.27	85.2	760.2	0.129	0.123	0.122	0	3.8
5:40	2.51	99	6.32	85.8	760.2	0.128	0.123	0.121	0	3
5:45	2.66	100.1	6.38	86.1	760.2	0.129	0.123	0.121	0	6.3
5:50	3.49	92.1	6.43	86.2	760.1	0.128	0.122	0.12	0	1.8
5:55	3.47	94.1	6.54	85.7	760.1	0.128	0.121	0.12	0	1.6
6:00	2.98	105.1	6.65	84.9	760.2	0.128	0.122	0.12	0	3.5
6:05	2	108.8	6.54	82.8	760.4	0.129	0.123	0.122	0	4.2
6:10	1.6	138.2	6.54	82.4	760.5	0.137	0.126	0.125	0	15.1
6:15	1.9	92.4	6.6	82.5	760.5	0.228	0.128	0.126	0.01	2.4
6:20	2.03	88.4	6.65	82.7	760.6	0.174	0.125	0.123	0	11.3
6:25	1.35	70.2	6.76	82.1	760.7	0.142	0.12	0.118	0	10.8
6:30	1.43	119.1	6.76	82.3	760.8	0.139	0.116	0.114	0	62.7
6:35	1.56	176.8	6.87	82.4	760.8	0.147	0.125	0.123	0	31.2
6:40	2.11	196.7	6.93	81.9	760.9	0.154	0.135	0.134	0	7.8
6:45	1.71	163.7	7.2	81.6	761	0.154	0.137	0.136	0	16.2
6:50	1.77	193.1	7.58	80.4	761.1	0.148	0.136	0.134	0	15.4
6:55	1.6	85.8	7.86	79	761.1	0.14	0.13	0.128	0	16.8
7:00	2.15	101.3	8.08	78.3	761.2	0.126	0.116	0.114	0	8.5
7:05	1.41	126.5	8.35	77.9	761.3	0.122	0.112	0.111	0	18.7
7:10	1.41	92.3	8.57	77.4	761.3	0.121	0.11	0.109	0	21.9
7:15	1.45	88.3	8.68	77.2	761.3	0.115	0.104	0.103	0	18.1
7:20	2.09	61.7	8.79	76.8	761.4	0.109	0.098	0.097	0	11.8
7:25	0.84	76.5	9.01	76.2	761.5	0.104	0.093	0.092	0	22.1

Report for 4/13/2011 - Day 103 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg

7:30	1.26	52.9	9.28	74.4	761.6	0.102	0.091	0.09	0	22.2
7:35	1.24	359.3	9.55	73.4	761.7	0.101	0.09	0.089	0	27.1
7:40	2.03	334.8	9.88	70	761.8	0.123	0.111	0.112	0	13.3
7:45	2.56	351.2	10.16	68.2	761.9	0.136	0.125	0.125	0	21.5
7:50	3.11	307.3	10.38	67.3	762	0.127	0.115	0.115	0	20.6
7:55	3.93	301.3	10.54	67.3	762.1	0.136	0.123	0.123	0	11.3
8:00	4.57	268.2	10.76	66.7	762.2	0.134	0.123	0.123	0	12.8
8:05	3.72	289.4	10.87	68.1	762.3	0.131	0.12	0.12	0	13.8
8:10	3.51	279.7	11.09	67.5	762.4	0.129	0.118	0.118	0	19
8:15	3.19	317.8	11.47	67	762.4	0.127	0.116	0.116	0	27.1
8:20	2.58	311.9	11.91	66.1	762.5	0.123	0.112	0.112	0	41.8
8:25	4.08	346.5	12.18	64.4	762.6	0.115	0.104	0.104	0	17.2
8:30	4.42	339.4	12.29	64.3	762.7	0.111	0.1	0.1	0	32.5
8:35	2.6	358.5	12.4	63	762.7	0.093	0.082	0.082	0	19.6
8:40	3.62	3.3	12.56	62.9	762.8	0.085	0.075	0.076	0	25.2
8:45	2.81	343.3	12.62	62.5	763	0.083	0.073	0.073	0	37.5

8:50	2.85	11.5	12.67	62.3	763.1	0.079	0.069	0.07	0	38.9
8:55	3.06	1.1	12.67	62.7	763.3	0.076	0.066	0.067	0	26.5
9:00	2.45	4.9	12.84	61.7	763.4	0.065	0.056	0.057	0	59.5
9:05	5.23	27.4	13.11	60.1	763.4	0.061	0.053	0.053	0	10.6
9:10	4.08	339.6	13.22	59.3	763.6	0.057	0.049	0.049	0	42.7
9:15	6.54	276.5	13.55	55.3	763.7	0.069	0.06	0.062	0	21.5
9:20	6.6	302.9	13.6	56	763.8	0.073	0.063	0.065	0	20.4
9:25	6.35	294.9	13.82	54.6	763.9	0.072	0.063	0.064	0	15
9:30	7.62	293.7	13.66	54.2	764	0.07	0.061	0.063	0	8
9:35	9.23	298.7	13.39	54.5	764	0.069	0.06	0.062	0	7.7
9:40	7.94	290.2	13.55	55.2	764.1	0.068	0.059	0.061	0	15.6
9:45	7.49	276.8	13.93	53.9	764.2	0.067	0.059	0.06	0	17.4
9:50	6.6	289.1	14.1	52.2	764.1	0.065	0.057	0.059	0	17.2
9:55	6.03	314.7	13.99	52.3	764.2	0.066	0.058	0.06	0	18.8
10:00	6.75	297.1	14.04	53.1	764.2	0.067	0.059	0.06	0	17.1
10:05	7.47	296	14.1	53.4	764.2	0.064	0.057	0.059	0	16.7
10:10	7.22	313.2	13.99	53.7	764.3	0.065	0.057	0.059	0	12.2
10:15	7.37	298.7	13.93	54.9	764.4	0.065	0.057	0.059	0	11.7
10:20	7.86	293.4	13.99	54.9	764.4	0.063	0.055	0.057	0	11.4
10:25	9.81	283.2	13.99	54.1	764.5	0.062	0.054	0.056	0	14.5
10:30	9.21	293.5	13.93	53.1	764.5	0.061	0.054	0.056	0	8.9
10:35	9.17	301.2	13.77	54.5	764.5	0.062	0.055	0.057	0	12.9
10:40	10.06	299.3	13.71	55	764.6	0.063	0.056	0.057	0	10.9
10:45	12.67	276.4	13.71	55.7	764.7	0.062	0.055	0.056	0	7.8
10:50	13.15	271.5	13.77	55.3	764.7	0.061	0.054	0.056	0	10.6
10:55	11.84	289.2	13.66	56.5	764.7	0.062	0.056	0.057	0	8
11:00	11.5	293.6	13.39	58.8	764.7	0.065	0.057	0.059	0	6.8
11:05	10.89	286.2	13.33	59.5	764.7	0.066	0.059	0.06	0	6.3
11:10	11.06	281.8	13.5	59.3	764.7	0.067	0.059	0.06	0	8.1

Report for 4/13/2011 - Day 103 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg

11:15	12.65	275.5	13.82	58.4	764.8	0.067	0.059	0.06	0	8.9
11:20	12.43	281.8	14.04	57.4	764.7	0.067	0.059	0.06	0	11.1
11:25	9.28	296.9	14.1	58.3	764.7	0.068	0.06	0.062	0	12.7
11:30	10.19	295.2	14.1	58	764.7	0.07	0.062	0.063	0	9.7
11:35	13.15	285.5	14.04	57.9	764.7	0.069	0.061	0.062	0	13.8
11:40	12.26	287.7	14.26	58	764.7	0.068	0.06	0.061	0	11.2
11:45	11.73	289.2	14.43	57.6	764.6	0.068	0.06	0.062	0	8.2
11:50	12.79	297.9	14.37	57.9	764.7	0.068	0.06	0.062	0	6.8
11:55	13.92	280.9	14.37	58.7	764.8	0.068	0.06	0.061	0	7.3
12:00	13.28	296.1	14.65	58.5	764.8	0.067	0.059	0.06	0	9.6

12:05	14.13	292	14.86	55.2	764.8	0.066	0.059	0.06	0	9.8
12:10	13.56	296.1	14.7	55.4	764.8	0.066	0.058	0.059	0	8.3
12:15	12.58	292.7	14.7	54	764.8	0.063	0.057	0.059	0	7.2
12:20	11.8	295.3	14.7	52.5	764.9	0.062	0.056	0.057	0	7.6
12:25	12.71	296.4	14.86	53.2	764.9	0.06	0.055	0.056	0	8.1
12:30	13.11	305.2	14.86	52.1	765	0.06	0.055	0.056	0	9.2
12:35	11.63	298.9	14.7	52.5	765	0.059	0.054	0.055	0	8.6
12:40	12.35	307.1	14.75	53.2	765.1	0.059	0.053	0.054	0	9.3
12:45	12.6	308.6	14.7	53	765.1	0.059	0.053	0.054	0	10.3
12:50	12.5	293	14.86	52.1	765.2	0.057	0.052	0.053	0	14.7
12:55	11.69	299.8	14.97	51.4	765.3	0.056	0.051	0.053	0	14.2
13:00	12.84	277.1	15.3	51.8	765.3	0.054	0.049	0.051	0	7.9
13:05	13.41	294.9	15.58	50.9	765.3	0.053	0.048	0.049	0	13.7
13:10	13.28	286.2	15.41	49	765.3	0.053	0.048	0.049	0	17.2
13:15	13.9	285.5	15.41	49.1	765.3	0.052	0.046	0.048	0	11.5
13:20	13.81	267.6	15.41	47.9	765.3	0.05	0.045	0.046	0	6.9
13:25	13.13	284	15.36	49.6	765.3	0.05	0.045	0.046	0	13.4
13:30	12.75	294.7	15.41	48.6	765.3	0.05	0.045	0.046	0	12.2
13:35	10.99	299.8	15.25	46.9	765.3	0.051	0.046	0.046	0	12.6
13:40	13.11	288.7	15.36	48.2	765.3	0.05	0.045	0.046	0	13.1
13:45	13.05	275.9	15.52	48.3	765.3	0.048	0.043	0.044	0	14.5
13:50	12.75	291.7	15.63	47.3	765.3	0.048	0.043	0.044	0	10.4
13:55	12.14	285.7	15.69	47.2	765.3	0.048	0.043	0.044	0	8.8
14:00	13.79	293.4	15.74	46.4	765.4	0.048	0.043	0.043	0	6.7
14:05	13.24	300.7	15.52	46.2	765.4	0.048	0.043	0.043	0	9.1
14:10	12.82	293.7	15.36	48.4	765.4	0.048	0.043	0.044	0	15.4
14:15	12.6	281.7	15.63	46.8	765.4	0.046	0.042	0.042	0	18.1
14:20	13.62	288.9	15.63	46.3	765.4	0.046	0.042	0.043	0	15.7
14:25	11.67	285.2	15.58	47.8	765.4	0.046	0.041	0.042	0	10.7
14:30	14.3	279.5	15.74	47.4	765.5	0.046	0.042	0.042	0	15.4
14:35	14.96	284	15.63	47.8	765.5	0.045	0.041	0.042	0	10
14:40	13.58	277.4	15.47	47.9	765.5	0.045	0.041	0.042	0	10.3
14:45	14.47	284.9	15.41	47.6	765.5	0.046	0.041	0.042	0	14.2
14:50	14.93	282.4	15.41	46.5	765.6	0.045	0.041	0.042	0	8.6
14:55	13.9	275.3	15.36	44.4	765.5	0.045	0.041	0.042	0	7.4

Report for 4/13/2011 - Day 103 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg

15:00	15.13	273.4	15.3	45.8	765.5	0.045	0.04	0.041	0	10.5
15:05	13.54	283.5	15.25	46.8	765.5	0.046	0.042	0.042	0	16
15:10	13.98	279.6	15.41	46.6	765.5	0.046	0.042	0.042	0	11.3
15:15	15.13	285.8	15.41	46.5	765.5	0.046	0.042	0.043	0	9

15:20	16.12	283.4	15.25	46.6	765.6	0.047	0.042	0.043	0	6.1
15:25	15.91	267.9	15.19	46.2	765.6	0.046	0.042	0.043	0	7.2
15:30	16.31	270.3	15.19	45.6	765.6	0.046	0.041	0.042	0	7.6
15:35	15.59	274.5	15.19	46	765.5	0.046	0.042	0.043	0	8
15:40	16.46	272.4	15.08	46.5	765.6	0.047	0.042	0.043	0	6.4
15:45	15.57	275.3	14.92	47.4	765.5	0.048	0.043	0.044	0	7.4
15:50	15.34	272.8	14.86	48.7	765.5	0.048	0.043	0.045	0	6.7
15:55	15.25	280.8	14.81	47.4	765.6	0.049	0.044	0.045	0	7.8
16:00	13.28	278.6	14.75	49.9	765.5	0.05	0.045	0.046	0	7.8
16:05	13.73	274.6	14.81	49.9	765.5	0.05	0.045	0.046	0	9.3
16:10	13.73	281.6	14.86	48.3	765.6	0.051	0.046	0.047	0	11.1
16:15	13.66	291.8	14.75	48	765.6	0.052	0.047	0.048	0	9.2
16:20	11.99	284.5	14.65	48.1	765.7	0.053	0.048	0.048	0	7.6
16:25	13.32	288.6	14.75	46.1	765.7	0.053	0.047	0.048	0	8.5
16:30	12.9	283.2	14.7	46.9	765.7	0.053	0.048	0.049	0	10.1
16:35	13.43	278.2	14.75	46.8	765.7	0.042	0.047	0.048	0	7
16:40	13.77	284.3	14.65	45.1	765.7	0.032	0.047	0.048	0	6
16:45	12.82	292.4	14.43	49.9	765.7	0.053	0.049	0.05	0	8.7
16:50	13.54	275.1	14.15	49.8	765.7	0.059	0.05	0.051	0	8.3
16:55	12.92	282.5	14.04	50.2	765.7	0.058	0.05	0.051	0	7.9
17:00	13.3	288.6	13.93	50.3	765.7	0.059	0.051	0.053	0	6
17:05	11.69	291.3	13.82	53.5	765.7	0.06	0.053	0.054	0	6
17:10	12.43	286.4	13.77	53.6	765.7	0.061	0.054	0.054	0	6
17:15	11.48	271.3	13.6	56.5	765.8	0.061	0.054	0.054	0	6.9
17:20	11.84	287.5	13.6	55.4	765.8	0.062	0.055	0.056	0	8.6
17:25	10.93	284.8	13.44	57	765.8	0.063	0.056	0.057	0	7.3
17:30	12.26	286	13.33	56.9	765.8	0.065	0.057	0.058	0	5
17:35	10.99	274	13.11	56.6	765.8	0.065	0.057	0.059	0	9.3
17:40	11.92	271.1	13.06	56.8	765.8	0.065	0.057	0.059	0	8.7
17:45	11.78	281.9	13	57.6	765.8	0.067	0.059	0.06	0	7.9
17:50	11.33	278.8	12.89	57.5	765.8	0.069	0.06	0.062	0	8
17:55	11.71	282.8	12.73	57.4	765.9	0.07	0.062	0.063	0	6.8
18:00	10.87	287.1	12.56	57.5	765.9	0.072	0.063	0.065	0	6.4
18:05	11.86	284.7	12.4	55.8	765.9	0.074	0.065	0.067	0	8.1
18:10	10.67	284.9	12.24	57.2	765.8	0.075	0.067	0.068	0	5.3
18:15	9.85	280.4	12.13	59.3	765.8	0.077	0.068	0.07	0	8.4
18:20	10.25	281.1	12.07	60.6	765.8	0.078	0.07	0.071	0	6.4
18:25	10.31	281.4	11.96	61.3	765.8	0.081	0.072	0.073	0	5.5
18:30	10.38	282.3	11.91	62	765.8	0.082	0.074	0.074	0	5.5
18:35	9.72	281.8	11.74	63.6	765.9	0.084	0.076	0.077	0	5
18:40	7.56	272.7	11.63	64.4	765.9	0.086	0.078	0.078	0	7.7

Report for 4/13/2011 - Day 103 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	

Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg
18:45	7.66	272.9	11.47	65	765.9	0.087	0.079	0.079	0	6.2
18:50	7.66	266.4	11.36	66.8	765.9	0.089	0.081	0.081	0	6.5
18:55	7.75	263.8	11.31	67.9	765.9	0.09	0.082	0.082	0	5.7
19:00	6.99	258.6	11.2	68.4	766	0.092	0.083	0.084	0	5
19:05	7.39	260.2	11.09	69.2	765.9	0.093	0.085	0.085	0	4.7
19:10	7.73	257.2	10.98	69.6	766	0.095	0.087	0.087	0	4.5
19:15	7.47	255.7	10.87	70.4	765.9	0.097	0.088	0.089	0	4.7
19:20	6.69	253.4	10.76	70.3	765.9	0.098	0.089	0.09	0	5.5
19:25	6.8	255.5	10.59	69.9	765.9	0.1	0.091	0.091	0	5.4
19:30	6.48	252.9	10.54	69.8	766	0.101	0.093	0.093	0	5.4
19:35	6.67	250.1	10.48	68.9	766	0.103	0.093	0.094	0	5.7
19:40	8	250	10.43	68.4	766	0.104	0.095	0.095	0	4.3
19:45	8.11	251.5	10.38	68.5	765.9	0.105	0.096	0.096	0	4.7
19:50	7.94	251.7	10.38	68.7	765.9	0.106	0.098	0.098	0	5.2
19:55	7.58	249.8	10.32	69	765.9	0.107	0.099	0.099	0	5.3
20:00	8.55	247.6	10.27	69.5	765.9	0.109	0.1	0.1	0	4.7
20:05	8.51	247.2	10.27	69.8	766	0.11	0.101	0.101	0	4.3
20:10	8.17	247.5	10.21	69.7	766	0.111	0.102	0.102	0	5.1
20:15	8.89	248	10.21	70.3	766.1	0.112	0.103	0.103	0	4.6
20:20	9.17	244.3	10.21	70.4	766.1	0.113	0.104	0.104	0	4.9
20:25	8.96	244	10.21	70.8	766.2	0.114	0.105	0.105	0	4.9
20:30	9.36	244	10.21	71.1	766.2	0.114	0.106	0.106	0	4.7
20:35	9.21	246.9	10.16	70.6	766.2	0.115	0.107	0.107	0	4.2
20:40	9	244.6	10.16	70.6	766.2	0.117	0.108	0.107	0	4.2
20:45	8.15	242.9	10.1	70.4	766.3	0.117	0.108	0.108	0	4.8
20:50	7.45	242.5	10.05	70.7	766.4	0.117	0.109	0.109	0	5.3
20:55	6.41	245.9	9.94	70.6	766.3	0.118	0.11	0.109	0	4.2
21:00	7.58	246.1	9.83	70.7	766.3	0.119	0.111	0.111	0	4.3
21:05	8.7	244.9	9.83	71.2	766.2	0.12	0.112	0.112	0	3.6
21:10	8.15	246.7	9.83	71.1	766.3	0.121	0.113	0.112	0	3.6
21:15	7.98	243.3	9.77	71.9	766.3	0.121	0.114	0.113	0	3.7
21:20	6.63	242.3	9.66	71.7	766.3	0.122	0.114	0.114	0	4.3
21:25	6.67	238.4	9.61	72.2	766.2	0.122	0.114	0.114	0	4.2
21:30	6.67	237.1	9.5	72.7	766.2	0.123	0.115	0.115	0	3.7
21:35	6.35	240.1	9.39	73.2	766.2	0.123	0.116	0.115	0	3.8
21:40	5.8	238.7	9.33	73.4	766.2	0.125	0.117	0.117	0	4.2
21:45	5.74	230.9	9.23	74	766.1	0.125	0.118	0.117	0	3.3
21:50	5.95	233	9.17	74.7	766.1	0.125	0.118	0.117	0	3.1
21:55	5.8	234.9	9.17	75	766.1	0.126	0.119	0.118	0	2.9
22:00	6.31	235.7	9.12	74.7	766.1	0.128	0.12	0.12	0	2.7
22:05	5.99	235.2	9.06	74.8	766	0.129	0.121	0.121	0	3.1
22:10	5.63	242	8.95	75.2	766	0.131	0.123	0.122	0	3
22:15	5.18	239.6	8.9	75.2	765.9	0.132	0.125	0.124	0	3.4
22:20	4.34	241.5	8.73	73.7	765.9	0.133	0.126	0.125	0	5.2
22:25	5.08	244.4	8.57	74.9	765.8	0.135	0.128	0.126	0	4.8

Report for 4/13/2011 - Day 103 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg
22:30	5.74	244.5	8.62	75.7	765.8	0.137	0.129	0.128	0	4.6
22:35	5.84	243.7	8.73	75.8	765.9	0.138	0.131	0.129	0	4.2
22:40	5.23	246.1	8.79	74.7	766	0.139	0.132	0.131	0	6.6
22:45	5.23	254	8.73	74.7	766	0.141	0.134	0.132	0	5.5
22:50	5.18	257.8	8.68	74.7	766	0.143	0.136	0.134	0	5
22:55	4.59	257.1	8.62	74.7	765.9	0.145	0.137	0.136	0	4.9
23:00	4.95	252.4	8.57	75.3	765.9	0.146	0.139	0.137	0	6.5
23:05	2.79	283.3	8.62	75	766	0.147	0.14	0.139	0	20
23:10	2.3	359.8	8.51	77.5	765.9	0.145	0.138	0.136	0	16.8
23:15	2.96	11	8.29	78.3	765.8	0.118	0.112	0.109	0	7.7
23:20	3.93	10.8	8.24	78.6	765.9	0.106	0.1	0.098	0	11
23:25	4.15	18.5	8.4	78.3	765.8	0.1	0.094	0.093	0	11.9
23:30	3.68	7.7	8.57	77.2	765.8	0.102	0.096	0.095	0	25.8
23:35	2.47	345	8.62	76.1	765.8	0.118	0.111	0.111	0	22.6
23:40	1.98	13.2	8.73	74.9	765.7	0.128	0.121	0.12	0	29.4
23:45	2.56	18.8	8.62	74.8	765.7	0.117	0.111	0.109	0	20.6
23:50	3.4	13.5	8.57	75.8	765.7	0.107	0.101	0.1	0	13.7
23:55	4.8	25.1	8.51	76.4	765.7	0.103	0.096	0.095	0	4.7
Totals	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		0.01
Savg	7.57	238.6	11.04	66.3	763.7	0.101	0.093	0.093	n/a	
Vavg	0	290.2	0	0	0	0	0	0	n/a	

Data Recover 100 %

Report for 4/14/2011 - Day 104 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg
0:00	4.87	19.8	8.35	76.6	765.7	0.097	0.091	0.09	0	4.2
0:05	3.49	17.2	8.13	76.9	765.7	0.094	0.088	0.087	0	7.2
0:10	4.04	17.4	7.8	79	765.7	0.093	0.087	0.086	0	7.8
0:15	1.81	342.7	7.64	79.9	765.6	0.098	0.092	0.091	0	39.4
0:20	1.77	299.4	7.42	81.3	765.6	0.125	0.118	0.119	0	46.2

0:25	1.54	315.3	7.25	82.8	765.5	0.148	0.141	0.141	0	13.4
0:30	2.15	318.4	7.25	83.5	765.6	0.165	0.158	0.158	0	12.8
0:35	1.16	268.7	7.2	81.9	765.6	0.171	0.164	0.163	0	38.5
0:40	1.01	230.9	6.93	80.5	765.6	0.163	0.156	0.154	0	46.1
0:45	1.73	332.3	6.76	82.6	765.7	0.167	0.16	0.158	0	5.7
0:50	2.43	312.9	6.76	85.3	765.8	0.178	0.171	0.169	0	13.3
0:55	1.84	330.9	6.93	86	765.6	0.182	0.175	0.173	0	17.6
1:00	2.85	324.9	7.04	84.5	765.7	0.187	0.18	0.178	0	4
1:05	2.28	303.8	6.93	83.4	765.6	0.188	0.181	0.179	0	12.8
1:10	2.45	287.9	6.65	82.9	765.6	0.184	0.178	0.175	0	5
1:15	2.75	274	6.6	84	765.6	0.183	0.176	0.174	0	26.4
1:20	3.09	204.5	6.43	82.2	765.6	0.176	0.17	0.167	0	17.1
1:25	1.5	193.1	6.11	84.1	765.5	0.166	0.159	0.156	0	22.8
1:30	2.68	165.2	6.11	85.4	765.4	0.159	0.153	0.15	0	5.2
1:35	2.32	181.9	6.21	86.8	765.5	0.155	0.149	0.147	0	3.3
1:40	2.92	196.3	6.38	87	765.5	0.156	0.15	0.148	0	9.3
1:45	3.3	221.8	6.43	86.1	765.5	0.161	0.154	0.153	0	4.9
1:50	3.23	210.7	6.49	86.3	765.5	0.165	0.159	0.158	0	7.7
1:55	3.21	174.9	6.65	84.8	765.5	0.165	0.159	0.156	0	11.4
2:00	1.94	196.1	6.32	82.8	765.5	0.161	0.155	0.153	0	14.2
2:05	1.18	125.3	5.89	82.5	765.6	0.161	0.154	0.152	0	58.6
2:10	1.58	81.1	5.34	81.7	765.4	0.148	0.143	0.14	0	12
2:15	1.69	86.9	5.01	85.3	765.4	0.139	0.133	0.13	0	15.2
2:20	2.2	132.9	5.06	88.6	765.3	0.139	0.134	0.132	0	9.6
2:25	3.36	132	5.28	90.4	765.3	0.146	0.14	0.139	0	4.7
2:30	3.23	125.5	5.12	88.2	765.2	0.148	0.143	0.141	0	3.3
2:35	2.85	128.3	4.9	87.5	765.1	0.149	0.143	0.142	0	6.9
2:40	2.64	134.2	4.9	88.6	765.1	0.151	0.145	0.143	0	9.3
2:45	2.81	149.8	4.85	87.9	765	0.154	0.148	0.146	0	6.1
2:50	3.11	151.6	4.74	88.6	765	0.157	0.151	0.149	0	7.3
2:55	3.28	170.3	4.79	90.2	765	0.161	0.156	0.153	0	3.5
3:00	2.43	148.7	4.96	90.6	765	0.165	0.159	0.157	0	15.9
3:05	1.75	122.8	4.79	87.1	765	0.162	0.156	0.154	0	14.8
3:10	1.14	91.3	4.52	86.7	765	0.157	0.152	0.149	0	16.6
3:15	1.07	105.6	4.3	87.4	765	0.151	0.146	0.143	0	14.9
3:20	0.63	97.7	4.24	89.1	765	0.152	0.147	0.144	0	25.8
3:25	0.71	177.9	4.3	89.9	765	0.151	0.145	0.143	0	92
3:30	0.71	167.6	4.19	89.8	765	0.165	0.159	0.158	0	39.2
3:35	0.61	91	4.08	89.7	765.1	0.165	0.159	0.157	0	6.7
3:40	0.97	21	4.08	90.3	765.1	0.156	0.151	0.148	0	34.7

Report for 4/14/2011 - Day 104 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg

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3:45	1.77	345.1	4.08	91.1	765.2	0.178	0.173	0.171	0	7.2
3:50	2.45	359.7	4.24	92.2	765.2	0.196	0.19	0.188	0	8.6
3:55	3.15	6.2	4.41	92.6	765.2	0.176	0.172	0.167	0	2.5
4:00	2.43	2.3	4.63	92.9	765	0.156	0.151	0.147	0	7.7
4:05	2.2	356	4.74	92.9	765	0.151	0.147	0.143	0	9.1
4:10	1.86	326.1	4.9	92.9	765	0.186	0.181	0.179	0	12
4:15	2.13	290.3	5.06	92.2	765.2	0.209	0.203	0.201	0	7.4
4:20	2.39	275.3	5.12	91	765.1	0.214	0.209	0.206	0	2
4:25	3.59	282.7	5.17	90.3	765.1	0.216	0.211	0.207	0	3.1
4:30	3.4	285.5	5.28	90.2	765	0.217	0.212	0.209	0	4
4:35	3.28	288.3	5.39	88.8	765	0.218	0.214	0.209	0	6.4
4:40	2.26	321.7	5.5	87.7	765.1	0.22	0.215	0.211	0	23.5
4:45	1.39	77.7	5.34	85.6	765.1	0.201	0.197	0.192	0	51.9
4:50	1.48	143.4	4.85	83.8	765.1	0.179	0.175	0.17	0	11.6
4:55	1.33	130.8	4.68	86.9	765.2	0.172	0.167	0.163	0	9.3
5:00	2.34	148.6	4.68	88.6	765.1	0.169	0.165	0.161	0	3.1
5:05	1.73	120.1	4.68	88.5	765	0.169	0.164	0.161	0	21.7
5:10	2.11	102.7	4.24	84.8	765	0.163	0.158	0.155	0	4.9
5:15	2.22	108.3	3.97	86.6	765	0.158	0.153	0.15	0	12.3
5:20	1.94	140.2	3.92	88.4	765	0.159	0.154	0.152	0	6.3
5:25	2.66	145.5	3.86	89.5	765.1	0.164	0.159	0.157	0	6.9
5:30	2.92	159.3	4.02	90.9	765.1	0.168	0.164	0.161	0	5.7
5:35	2.87	163	4.24	91.6	765.2	0.173	0.168	0.165	0	3.8
5:40	1.92	164.7	4.35	89.6	765.3	0.175	0.17	0.168	0	8.7
5:45	2.09	156	4.35	88.9	765.3	0.175	0.17	0.167	0	4.3
5:50	1.84	148.3	4.46	89.4	765.3	0.175	0.17	0.167	0	8.9
5:55	1.43	107.2	4.52	88.3	765.3	0.17	0.165	0.162	0	16.3
6:00	1.14	115.8	4.46	87.5	765.5	0.163	0.158	0.155	0	18.2
6:05	1.52	111.8	4.52	88.2	765.4	0.16	0.155	0.152	0	12.3
6:10	1.94	104.5	4.52	88.1	765.4	0.159	0.153	0.151	0	8.2
6:15	2.03	87.5	4.57	88.3	765.4	0.155	0.15	0.147	0	4.3
6:20	3	99	4.63	88.4	765.3	0.152	0.147	0.144	0	5.5
6:25	2.75	111.6	4.74	87.8	765.4	0.152	0.147	0.145	0	6.8
6:30	2.2	113.8	4.9	87.4	765.5	0.153	0.148	0.146	0	4
6:35	2.09	106.4	5.12	88.1	765.6	0.153	0.148	0.145	0	6.4
6:40	1.98	119.9	5.28	87.7	765.6	0.152	0.147	0.145	0	6.1
6:45	1.07	143.4	5.45	87.4	765.8	0.154	0.149	0.147	0	23.7
6:50	1.2	118.5	5.72	87	765.9	0.156	0.151	0.148	0	25.6
6:55	1.5	89.4	5.94	85.9	765.9	0.15	0.144	0.142	0	10.8
7:00	1.18	86.6	6.11	85	766	0.142	0.137	0.135	0	15.8
7:05	1.16	66	6.32	84	766.2	0.136	0.131	0.129	0	20.9
7:10	1.28	99.9	6.49	82.7	766.2	0.132	0.128	0.126	0	20.7
7:15	1.41	98	6.76	81.3	766.2	0.131	0.126	0.125	0	18.1
7:20	1.16	124.4	7.09	80	766.3	0.132	0.126	0.125	0	18.2
7:25	1.45	94.5	7.42	77.5	766.5	0.131	0.125	0.124	0	18.9

Report for 4/14/2011 - Day 104 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg
7:30	1.69	81.8	7.58	76.7	766.7	0.123	0.117	0.116	0	22.9
7:35	2.3	104.7	7.75	76.3	766.6	0.12	0.114	0.112	0	13.5
7:40	2.94	124.4	7.91	76	766.5	0.12	0.113	0.112	0	13.6
7:45	2.94	147.8	8.13	75.6	766.7	0.12	0.112	0.111	0	29.3
7:50	2.77	151.6	8.35	75	766.7	0.12	0.112	0.111	0	18.5
7:55	2.96	159.6	8.51	74.6	766.9	0.119	0.111	0.111	0	22
8:00	3.02	149.2	8.68	74.2	766.9	0.115	0.107	0.107	0	20.7
8:05	3.45	118	8.95	72.8	767	0.109	0.101	0.1	0	16.1
8:10	3.3	125.2	9.17	72.3	767.1	0.099	0.094	0.094	0	13.1
8:15	3.26	119.7	9.39	71.8	767.3	0.087	0.089	0.089	0	19.6
8:20	3.38	166.7	9.61	71.1	767.6	0.094	0.088	0.088	0	16.4
8:25	3.02	169.4	9.88	69.5	767.6	0.109	0.087	0.087	0	32.2
8:30	2.32	205.3	10.1	68	767.7	0.109	0.089	0.089	0	29.6
8:35	2.17	147	10.32	67.8	767.8	0.103	0.084	0.085	0	14.6
8:40	2.17	149.2	10.48	67.2	767.9	0.095	0.078	0.078	0	37.7
8:45	2.96	103.6	10.81	66.5	767.9	0.085	0.071	0.072	0	49
8:50	3.57	133.5	10.98	65.7	767.9	0.081	0.067	0.067	0	36.7
8:55	4.02	188.6	11.2	64.9	767.8	0.086	0.069	0.07	0	28.7
9:00	2.75	180.8	11.36	64.2	767.9	0.085	0.068	0.068	0	30.2
9:05	1.67	198.6	11.63	61.9	767.8	0.087	0.068	0.069	0	54
9:10	1.96	116.1	12.13	61.7	768	0.082	0.062	0.063	0	24.1
9:15	3.83	78.5	12.4	60	768	0.072	0.053	0.054	0	16.8
9:20	2.32	81.9	12.4	59.1	768.1	0.069	0.05	0.051	0	76.5
9:25	1.6	72	12.73	57.6	768.3	0.068	0.05	0.051	0	58.4
9:30	2.47	350.2	13	55.9	768.4	0.067	0.049	0.051	0	59.9
9:35	2.56	24.9	13.39	55.7	768.5	0.058	0.046	0.047	0	33.1
9:40	3.26	354.8	13.77	54.6	768.6	0.053	0.044	0.045	0	41.1
9:45	2.58	339.3	13.99	51.5	768.6	0.055	0.047	0.048	0	30.1
9:50	3.79	9.1	13.99	51	768.6	0.053	0.045	0.046	0	27.6
9:55	3.47	338.7	14.04	50.5	768.6	0.051	0.043	0.045	0	25
10:00	3.45	17.1	14.32	48.4	768.6	0.047	0.04	0.04	0	32.7
10:05	4.27	328.7	14.37	47.7	768.5	0.049	0.042	0.043	0	19.8
10:10	4.97	290.4	14.7	46.9	768.6	0.053	0.046	0.046	0	17.7
10:15	3.89	297.2	15.08	44.9	768.7	0.051	0.044	0.045	0	39.6
10:20	4.93	245.8	15.41	44.1	768.7	0.046	0.04	0.041	0	18.1
10:25	4.06	259.7	15.58	43.1	768.7	0.045	0.039	0.04	0	42
10:30	4.63	310	15.58	38.4	768.7	0.046	0.04	0.041	0	19.7
10:35	4.32	301.2	15.74	34.9	768.8	0.048	0.042	0.042	0	18.7
10:40	6.16	302.6	15.9	34.8	768.8	0.047	0.041	0.042	0	23.6
10:45	6.88	311.2	16.01	35.7	768.9	0.046	0.04	0.042	0	17.7

10:50	8.19	310.2	15.96	36	769	0.046	0.041	0.042	0	10.1
10:55	7.58	318.2	15.79	33.4	769	0.046	0.041	0.042	0	9.9
11:00	8.51	294	15.79	32.9	769.1	0.046	0.04	0.041	0	9.8
11:05	9.11	313.2	15.96	34.9	769.1	0.045	0.039	0.04	0	12
11:10	7.49	313.3	16.01	34.5	768.9	0.045	0.04	0.041	0	12.7

Report for 4/14/2011 - Day 104 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg

11:15	5.5	299.8	16.12	33.8	768.7	0.045	0.04	0.041	0	26.9
11:20	7.96	305.2	16.56	32.3	768.6	0.043	0.038	0.039	0	20.5
11:25	5.76	317.4	16.51	31.9	768.6	0.044	0.038	0.04	0	26.7
11:30	4.97	297.4	16.73	32.9	768.6	0.043	0.038	0.038	0	30.1
11:35	5.08	329.6	17.16	32.1	768.5	0.042	0.036	0.037	0	27.5
11:40	7.66	311.8	17.27	31.8	768.5	0.043	0.037	0.038	0	12.1
11:45	6.46	293	17.22	31.4	768.6	0.042	0.036	0.037	0	26.3
11:50	6.14	309.5	17.27	31.3	768.6	0.04	0.035	0.035	0	23.8
11:55	6.37	328.7	17.44	31.3	768.6	0.04	0.034	0.035	0	26.8
12:00	5.91	296.3	17.55	31.3	768.6	0.035	0.03	0.031	0	33.1
12:05	6.56	270.4	17.93	30.5	768.6	0.037	0.032	0.032	0	16.5
12:10	7.24	283.4	18.04	30.3	768.6	0.036	0.031	0.031	0	13.6
12:15	6.63	264.3	17.87	31.1	768.6	0.035	0.03	0.031	0	19.8
12:20	6.24	289.7	18.04	31.3	768.5	0.035	0.031	0.031	0	17.1
12:25	6.46	284	18.04	31.5	768.6	0.035	0.03	0.031	0	12.9
12:30	7.58	307.5	17.98	32.7	768.5	0.035	0.031	0.031	0	14.6
12:35	8.26	304.7	17.87	33.8	768.6	0.036	0.031	0.031	0	11.8
12:40	11.1	291.9	17.87	34.6	768.6	0.035	0.03	0.031	0	9.8
12:45	7.92	280.1	18.04	34	768.6	0.034	0.029	0.029	0	15.8
12:50	9.83	291.3	18.09	34.2	768.6	0.034	0.029	0.029	0	14.2
12:55	9.49	291.4	18.09	33.2	768.5	0.034	0.029	0.029	0	11.2
13:00	7.9	286.2	17.87	33.3	768.4	0.033	0.028	0.029	0	13.2
13:05	8.45	288.8	17.82	34.1	768.4	0.033	0.028	0.029	0	17.8
13:10	8.49	295.3	17.82	34.6	768.4	0.034	0.029	0.029	0	13.3
13:15	7.58	293.8	17.71	35.3	768.5	0.034	0.029	0.029	0	19.9
13:20	9.7	302.1	17.77	36	768.5	0.034	0.029	0.029	0	11.7
13:25	9.02	284.7	17.71	36.1	768.6	0.033	0.028	0.029	0	11.5
13:30	10.36	286.7	17.82	36.5	768.6	0.032	0.027	0.028	0	10.5
13:35	9.91	298.5	17.87	36.8	768.6	0.033	0.028	0.029	0	11
13:40	11.01	296.1	17.93	37.2	768.6	0.033	0.028	0.029	0	10.5
13:45	10.76	290.4	17.87	37.2	768.6	0.033	0.028	0.029	0	11.6
13:50	11.73	282.8	17.93	37.4	768.6	0.032	0.027	0.028	0	10.5
13:55	11.78	288.5	17.98	37.9	768.5	0.032	0.027	0.028	0	13.5
14:00	11.56	288.5	17.82	37.6	768.4	0.033	0.028	0.029	0	8

14:05	11.86	288.4	17.6	38.3	768.3	0.033	0.028	0.029	0	8.8
14:10	12.5	279.4	17.49	38.2	768.4	0.033	0.028	0.029	0	6.9
14:15	13.03	278.9	17.38	38.9	768.4	0.033	0.028	0.029	0	9.1
14:20	12.79	287.6	17.38	38.5	768.4	0.033	0.029	0.029	0	8.9
14:25	13.01	293.1	17.22	38.2	768.4	0.034	0.029	0.029	0	10.6
14:30	12.84	283.3	17.11	37.7	768.3	0.034	0.029	0.029	0	8.2
14:35	12.18	286.2	17.16	37.9	768.2	0.034	0.029	0.03	0	9.8
14:40	11.63	290.4	17.11	37.7	768.1	0.034	0.029	0.03	0	8.1
14:45	10.29	292.3	16.89	38	768	0.035	0.03	0.031	0	8.2
14:50	11.27	281	16.83	39.1	767.9	0.035	0.03	0.031	0	10.1
14:55	10.06	289.9	16.89	38.9	767.9	0.035	0.031	0.031	0	10.2

Report for 4/14/2011 - Day 104 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg
15:00	11.06	288.8	16.94	38.3	767.9	0.035	0.031	0.031	0	9.7
15:05	11.23	289	17	37.9	767.8	0.035	0.031	0.031	0	7.9
15:10	11.16	294.5	16.94	38.3	767.8	0.036	0.031	0.032	0	8.8
15:15	10.65	293.3	16.94	37.5	767.8	0.036	0.031	0.032	0	7.5
15:20	12.37	298.7	16.89	37.5	767.9	0.037	0.031	0.032	0	7.1
15:25	12.33	297	16.89	38.8	767.9	0.037	0.032	0.032	0	11
15:30	13.71	286.9	17	38.2	768	0.037	0.032	0.032	0	12.7
15:35	13.24	284	17	38.7	767.9	0.037	0.032	0.032	0	13.3
15:40	13.51	279.4	17	38.5	767.9	0.036	0.031	0.032	0	12.1
15:45	11.8	284.1	16.67	39.3	767.8	0.037	0.032	0.033	0	10
15:50	12.52	270.9	16.45	39.1	767.8	0.037	0.032	0.033	0	7.6
15:55	14.68	273.7	16.51	39.5	767.7	0.037	0.032	0.034	0	7.7
16:00	11.76	279.3	16.29	39.9	767.6	0.038	0.034	0.034	0	7.5
16:05	12.41	280.5	16.23	41	767.5	0.04	0.035	0.035	0	7.1
16:10	11.76	281.3	16.34	40.5	767.5	0.04	0.035	0.036	0	12.4
16:15	12.18	276.3	16.34	40	767.4	0.04	0.035	0.037	0	7.3
16:20	11.88	277.4	16.12	40.1	767.3	0.041	0.036	0.037	0	7.8
16:25	11.33	279.4	15.96	41.7	767.3	0.042	0.037	0.038	0	9.5
16:30	11.65	289	15.96	42.5	767.2	0.043	0.038	0.039	0	6.4
16:35	10.93	287	15.96	43	767.2	0.045	0.039	0.04	0	9.1
16:40	11.54	283.7	15.96	42.4	767.1	0.045	0.04	0.04	0	7.2
16:45	12.01	280.8	15.79	43.9	767	0.045	0.04	0.041	0	5.5
16:50	12.31	282.2	15.79	44.5	767	0.046	0.041	0.042	0	6.8
16:55	11.42	284.8	15.9	43.5	767	0.047	0.042	0.042	0	7.1
17:00	12.31	278.4	15.96	45	767	0.047	0.042	0.043	0	8.3
17:05	12.88	286.4	15.79	47.6	767	0.048	0.042	0.043	0	8.4
17:10	14.11	284.6	15.58	47.6	767	0.049	0.043	0.044	0	8.7
17:15	13.32	285.4	15.3	45.5	766.9	0.049	0.043	0.045	0	6.1

17:20	12.2	284.6	15.14	45.5	766.8	0.049	0.044	0.045	0	9.6
17:25	11.71	291.1	15.08	47.7	766.7	0.051	0.045	0.046	0	5.4
17:30	12.41	290	15.03	46.8	766.7	0.052	0.046	0.047	0	6.3
17:35	12.07	288.9	14.86	48.8	766.7	0.053	0.047	0.048	0	5.7
17:40	11.76	285.2	14.7	52	766.7	0.054	0.048	0.049	0	8.7
17:45	10.7	292	14.54	53.1	766.7	0.056	0.05	0.051	0	7.4
17:50	11.92	286.8	14.37	51.3	766.6	0.057	0.051	0.052	0	5.4
17:55	10.48	289.1	14.15	55.8	766.6	0.059	0.053	0.053	0	6.2
18:00	11.67	282.9	13.93	58.4	766.6	0.06	0.054	0.054	0	5.8
18:05	12.33	279.5	13.82	61.1	766.7	0.061	0.055	0.056	0	4.7
18:10	11.65	282.4	13.6	61.7	766.6	0.063	0.056	0.057	0	5.7
18:15	11.95	282.1	13.44	62.5	766.5	0.065	0.058	0.059	0	5.5
18:20	10.97	282.9	13.22	63.4	766.4	0.067	0.06	0.061	0	8.4
18:25	10.8	280.6	13.06	64	766.3	0.068	0.061	0.062	0	4.8
18:30	9.28	278.6	12.89	64.8	766.3	0.07	0.063	0.063	0	5.7
18:35	9.55	279.7	12.78	64.7	766.2	0.072	0.065	0.065	0	5.8
18:40	10.95	274.5	12.67	63.4	766.2	0.075	0.066	0.067	0	5

Report for 4/14/2011 - Day 104 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg
18:45	10.63	279.4	12.56	64.7	766.1	0.079	0.068	0.069	0	4.1
18:50	10.72	279.2	12.46	65.4	766	0.08	0.07	0.071	0	5.3
18:55	10.95	283.2	12.29	66.1	765.9	0.082	0.072	0.073	0	4.6
19:00	8.77	288.8	12.18	67	765.8	0.084	0.075	0.076	0	6
19:05	8.19	294.1	12.02	68.9	765.8	0.087	0.078	0.079	0	6.4
19:10	8.45	291.6	11.85	69.4	765.7	0.092	0.081	0.081	0	6.2
19:15	8.47	289.1	11.74	69.7	765.8	0.093	0.082	0.083	0	6.1
19:20	8.81	289.8	11.63	70.5	765.7	0.095	0.084	0.085	0	5.5
19:25	7.81	291.9	11.52	71.1	765.8	0.096	0.086	0.087	0	5.9
19:30	8.49	293.7	11.47	72	765.7	0.098	0.089	0.089	0	5.3
19:35	8.15	296.5	11.36	72.5	765.7	0.101	0.091	0.092	0	6.3
19:40	8.11	294	11.31	72.5	765.7	0.103	0.093	0.093	0	5.7
19:45	8.05	297.6	11.25	72.7	765.7	0.105	0.095	0.095	0	6.2
19:50	8.15	296.6	11.2	72.8	765.7	0.107	0.097	0.097	0	6.5
19:55	8.79	291.3	11.14	72.3	765.7	0.108	0.098	0.098	0	6.5
20:00	9.32	285.5	11.2	71.6	765.8	0.109	0.099	0.099	0	5.6
20:05	9.76	277.2	11.2	71.4	765.8	0.109	0.099	0.1	0	5.5
20:10	10.19	276.7	11.25	71.1	765.7	0.109	0.1	0.1	0	5
20:15	9.02	280.6	11.25	70.5	765.7	0.111	0.1	0.1	0	4.7
20:20	8.39	281	11.2	70.1	765.6	0.111	0.101	0.101	0	5.5
20:25	8.43	284.7	11.14	70.4	765.6	0.112	0.103	0.103	0	5
20:30	8.28	285.3	11.09	70.3	765.6	0.114	0.104	0.104	0	4.7

20:35	8.09	285.7	11.03	70	765.6	0.115	0.105	0.105	0	5.2
20:40	7.33	292.1	10.98	70.1	765.5	0.115	0.106	0.106	0	7.2
20:45	5.65	305	10.92	71.8	765.5	0.117	0.109	0.109	0	7.3
20:50	6.41	306.6	10.76	72.4	765.5	0.119	0.111	0.111	0	6
20:55	5.84	315.7	10.76	72.6	765.5	0.121	0.114	0.114	0	7.7
21:00	5.67	324	10.7	72.9	765.5	0.124	0.117	0.116	0	6
21:05	6.22	324.2	10.7	73.2	765.5	0.127	0.119	0.118	0	5.3
21:10	5.67	332.9	10.7	72.2	765.5	0.129	0.121	0.12	0	7.3
21:15	5.52	337.9	10.7	73.7	765.4	0.131	0.123	0.123	0	7.4
21:20	5.65	337	10.59	74.7	765.4	0.133	0.125	0.125	0	5.5
21:25	5.57	340	10.59	75.3	765.3	0.135	0.127	0.126	0	5.5
21:30	5.95	351.8	10.59	76.4	765.3	0.134	0.126	0.126	0	9
21:35	6.24	350.3	10.59	77.5	765.3	0.124	0.117	0.115	0	6
21:40	5.95	3.9	10.54	78.3	765.3	0.119	0.111	0.111	0	7.2
21:45	5.48	14.8	10.43	78.8	765.2	0.093	0.086	0.085	0	4.2
21:50	5.33	18.2	10.21	78.4	765.2	0.079	0.073	0.073	0	4.8
21:55	6.29	12.5	9.99	79	765.2	0.076	0.069	0.068	0	4
22:00	6.75	10.5	9.99	80.6	765.1	0.081	0.068	0.067	0	5.1
22:05	5.67	2.7	10.05	81	765.1	0.08	0.07	0.07	0	6.4
22:10	5.27	2.7	10.05	81.9	765.1	0.087	0.076	0.076	0	8.6
22:15	4.87	353.3	10.1	82	765.1	0.095	0.084	0.085	0	9.3
22:20	4.48	342.2	10.1	81.3	765.1	0.124	0.113	0.114	0	6.8
22:25	4.02	330.6	9.99	80.5	765.1	0.14	0.129	0.129	0	11

Report for 4/14/2011 - Day 104 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg

22:30	4.61	347.1	9.66	82.6	765.1	0.145	0.134	0.133	0	11.9
22:35	5.04	7.7	9.55	83	765.1	0.124	0.114	0.112	0	8.4
22:40	5.04	3	9.55	83.4	765.1	0.098	0.089	0.087	0	7.1
22:45	4.48	327.5	9.5	83.9	765.1	0.11	0.1	0.1	0	9.2
22:50	5.84	343.7	9.55	83.3	765.2	0.136	0.125	0.126	0	10.5
22:55	4.65	330.1	9.72	82.3	765.2	0.147	0.136	0.136	0	9.3
23:00	3.55	332	9.61	82.2	765.2	0.151	0.14	0.14	0	7.1
23:05	3.91	340.9	9.44	83.6	765.2	0.154	0.143	0.142	0	5.8
23:10	4.76	344	9.44	83.8	765.2	0.157	0.146	0.145	0	4.4
23:15	4.42	1.2	9.44	84.4	765.2	0.147	0.137	0.135	0	7.2
23:20	3.87	354.5	9.5	84.4	765.1	0.131	0.121	0.12	0	8
23:25	4.34	1.7	9.55	84.1	765.1	0.128	0.118	0.117	0	9.6
23:30	4.61	11.4	9.61	83.5	765.1	0.107	0.098	0.096	0	6
23:35	5.1	17.1	9.66	82.6	765.1	0.093	0.084	0.083	0	4.2
23:40	5.06	20.3	9.72	81.4	765	0.088	0.079	0.079	0	3.5
23:45	4.38	22.3	9.72	81	765	0.086	0.078	0.077	0	4.9

23:50	3.76	20.7	9.66	81.5	765	0.086	0.078	0.077	0	5.7
23:55	4.08	1.3	9.55	81.7	765.1	0.087	0.079	0.079	0	6

Totals	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
Savg	5.97	224.1	11.11	65.4	766.6	0.1	0.093	0.092	n/a
Vavg	0	302.6	0	0	0	0	0	0	n/a

Data Recover 100 %

Report for 4/15/2011 - Day 105 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg
0:00	4.61	345.3	9.44	83.2	765.2	0.117	0.107	0.109	0	3.2
0:05	4.51	330.3	9.44	83.6	765.3	0.145	0.135	0.136	0	7.9
0:10	4.06	321.6	9.33	82.4	765.2	0.154	0.145	0.144	0	3.3
0:15	3.7	321.7	9.12	83.2	765.1	0.159	0.148	0.147	0	13.4
0:20	3.06	331.1	8.95	83.9	765.1	0.16	0.15	0.149	0	7
0:25	2.05	280.9	8.9	83.6	765	0.161	0.151	0.15	0	33.5
0:30	2.2	220.5	8.68	83.2	764.9	0.152	0.142	0.14	0	13.3
0:35	3.34	246.6	8.46	78.4	764.8	0.144	0.134	0.133	0	13.2
0:40	3.66	265.9	8.19	78.1	764.8	0.145	0.136	0.134	0	3.2
0:45	3.62	277.7	7.97	79.6	764.7	0.148	0.139	0.137	0	3.5
0:50	4.44	279.6	7.91	80.3	764.8	0.152	0.142	0.141	0	1.7
0:55	4.68	281.1	7.91	80.6	764.8	0.154	0.144	0.143	0	4.3
1:00	4.57	299.9	8.08	80.2	764.9	0.157	0.147	0.146	0	9.3
1:05	3.32	335.3	8.08	80.3	764.9	0.161	0.151	0.15	0	15.4
1:10	3.19	3.3	8.08	80.4	764.8	0.151	0.142	0.14	0	8.1
1:15	2.7	333.6	8.02	80.6	764.8	0.142	0.133	0.131	0	12.1
1:20	1.77	11.9	7.97	81	764.6	0.154	0.144	0.143	0	20.5
1:25	1.22	27.1	7.91	81.1	764.5	0.129	0.12	0.117	0	29.6
1:30	1.56	341	7.91	81.6	764.4	0.128	0.118	0.117	0	12.4
1:35	1.96	352.5	8.19	82.9	764.4	0.153	0.143	0.143	0	9.8
1:40	1.98	347.3	8.35	84.1	764.4	0.16	0.15	0.15	0	4.4
1:45	2.05	333.9	8.4	85.9	764.4	0.172	0.162	0.162	0	3.6
1:50	1.69	334.2	8.29	85.2	764.4	0.178	0.168	0.167	0	11
1:55	2.17	279.2	8.13	82.7	764.5	0.178	0.168	0.167	0	24.8
2:00	3.11	277.5	7.91	83	764.5	0.171	0.162	0.159	0	7.3
2:05	2.66	291.3	7.97	81.7	764.5	0.17	0.161	0.159	0	8.7
2:10	1.43	278.4	7.97	80.3	764.3	0.17	0.161	0.159	0	14
2:15	1.33	327.2	7.75	80.2	764.4	0.17	0.161	0.159	0	24.2
2:20	2.9	309.7	7.58	81.8	764.5	0.172	0.163	0.161	0	17.6

2:25	3.81	286.7	7.64	83.9	764.5	0.175	0.165	0.164	0	6.2
2:30	3.74	289.2	7.75	82.7	764.4	0.175	0.166	0.164	0	6.1
2:35	4.15	284.2	7.75	81.5	764.5	0.175	0.166	0.164	0	3.7
2:40	4.59	281.1	7.64	81.3	764.5	0.175	0.165	0.163	0	3.6
2:45	4.85	277.9	7.58	81.9	764.5	0.174	0.165	0.163	0	2.8
2:50	5.38	273.2	7.58	82.6	764.4	0.174	0.165	0.162	0	3.4
2:55	4.8	271.6	7.69	82.2	764.5	0.173	0.164	0.162	0	4.2
3:00	3.98	257.1	7.75	81.9	764.4	0.173	0.164	0.161	0	5.7
3:05	4.19	250.9	7.75	82.2	764.4	0.17	0.161	0.159	0	8
3:10	5.61	266.6	7.86	83.8	764.4	0.17	0.161	0.159	0	4.8
3:15	5.76	281	8.08	84.3	764.4	0.173	0.164	0.162	0	3.1
3:20	5.5	293	8.35	83.5	764.3	0.176	0.167	0.165	0	5
3:25	4.91	298.3	8.46	82.4	764.3	0.179	0.17	0.168	0	3.9
3:30	4.7	295.3	8.57	81	764.3	0.181	0.172	0.17	0	1.8
3:35	4.63	300.6	8.57	80.8	764.3	0.181	0.172	0.17	0	3.7
3:40	3.57	301.3	8.46	80.6	764.3	0.182	0.173	0.171	0	3.4

Report for 4/15/2011 - Day 105 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg

3:45	2.41	310.5	8.29	80.2	764.2	0.183	0.173	0.171	0	12.9
3:50	1.71	324.7	8.13	80.8	764.1	0.186	0.176	0.174	0	8.8
3:55	2.2	77.6	7.91	80.5	764.1	0.181	0.172	0.169	0	69.5
4:00	3.49	118.3	7.42	80.1	764	0.155	0.147	0.143	0	5.3
4:05	3.81	108	7.15	83.2	764	0.141	0.132	0.129	0	2.5
4:10	3.62	98.3	7.04	85.1	764	0.134	0.125	0.123	0	2.6
4:15	2.92	89.3	6.93	85.3	764	0.13	0.121	0.12	0	3.5
4:20	2.64	88.9	6.82	85.8	764	0.128	0.119	0.117	0	1.9
4:25	2.34	81.9	6.82	87.2	764	0.126	0.118	0.116	0	3.3
4:30	2.22	93.5	6.87	88	764	0.126	0.118	0.116	0	5.5
4:35	1.79	73.1	6.82	87.7	764	0.126	0.118	0.117	0	3.6
4:40	1.35	8.7	6.82	87.5	764.1	0.128	0.119	0.118	0	38.6
4:45	2.13	318.3	6.76	87.9	764.2	0.158	0.148	0.148	0	10
4:50	1.98	306.7	6.76	88.7	764.2	0.178	0.169	0.168	0	5.9
4:55	1.79	269.3	6.71	88.8	764.1	0.186	0.176	0.175	0	19.3
5:00	1.22	248.8	6.43	88.5	764.1	0.183	0.175	0.172	0	20.2
5:05	0.82	180.1	6.32	89.4	764.1	0.175	0.168	0.165	0	27.3
5:10	1.5	137.7	6.27	89.6	764.1	0.163	0.154	0.151	0	7.4
5:15	1.86	132.9	6.27	90.2	764.1	0.154	0.145	0.143	0	2.1
5:20	2.39	140.9	6.38	90.6	764.1	0.15	0.141	0.139	0	7.1
5:25	2.41	155.1	6.43	89.3	764.1	0.15	0.142	0.14	0	4.4
5:30	2.75	148.3	6.32	87.8	764.1	0.15	0.143	0.14	0	3.6
5:35	2.85	148.8	6.27	88.2	764	0.148	0.142	0.14	0	3.9

5:40	3.53	157	6.32	88.6	764	0.149	0.143	0.141	0	0.9
5:45	2.64	103.6	6.16	86.3	764	0.148	0.142	0.14	0	41.8
5:50	2.75	73.8	5.78	85	764.1	0.137	0.131	0.129	0	16.6
5:55	2.62	86.7	5.72	87.5	764	0.131	0.126	0.124	0	17.6
6:00	3.57	101.1	5.94	89.2	764	0.132	0.126	0.125	0	10.9
6:05	2.62	108.7	6.16	89.9	764	0.134	0.128	0.127	0	7.9
6:10	2.26	119.3	6.38	89.9	764	0.137	0.131	0.129	0	3.8
6:15	2.17	106.9	6.49	88.9	764	0.138	0.132	0.13	0	7.8
6:20	1.69	101.1	6.65	88	764.1	0.142	0.13	0.128	0	10.2
6:25	1.62	141	6.82	87.4	764.1	0.142	0.13	0.128	0	16.7
6:30	1.69	155.5	7.09	86.1	764.1	0.143	0.133	0.131	0	19.8
6:35	1.98	160.2	7.31	84.9	764.1	0.145	0.134	0.133	0	16.6
6:40	2.41	160.3	7.53	83.8	764.2	0.144	0.134	0.132	0	8.6
6:45	3.3	161.2	7.8	83.3	764.2	0.14	0.131	0.129	0	9.6
6:50	3.4	160.3	8.19	83	764.3	0.137	0.127	0.126	0	8.8
6:55	5.27	173.5	8.57	82.1	764.3	0.136	0.124	0.123	0	4.9
7:00	5.38	159.1	8.62	81	764.4	0.132	0.121	0.12	0	6.1
7:05	4.53	159.7	8.68	80.6	764.4	0.128	0.116	0.115	0	7.7
7:10	4.12	151.8	8.84	80.2	764.5	0.124	0.112	0.112	0	9.2
7:15	3.66	156.4	9.06	79.6	764.6	0.12	0.108	0.107	0	10.5
7:20	3.45	142.2	9.39	78.4	764.7	0.117	0.104	0.103	0	12.6
7:25	2.73	139.7	9.77	77.8	764.7	0.112	0.099	0.098	0	17.8

Report for 4/15/2011 - Day 105 > AUTOMET < Station

Channel	1	2	3	4	5	6	7	8	Rain	Sigma
Sensor	RWS	RWD	AT	RH	BP	no	no	no	RA	
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg

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7:30	2.07	124.2	10.1	76.1	764.8	0.106	0.093	0.093	0	16.7
7:35	2.03	98.1	10.43	75.1	764.9	0.1	0.087	0.087	0	16.4
7:40	1.31	73	10.76	74.1	764.9	0.092	0.078	0.078	0	30.5
7:45	1.92	68.9	11.14	72.6	764.9	0.085	0.071	0.071	0	15.6
7:50	1.71	23.7	11.36	70.6	765	0.084	0.069	0.069	0	49.4
7:55	1.73	304.3	11.74	68.7	765.1	0.09	0.078	0.078	0	53.3
8:00	2.11	316.1	12.24	65.6	765.2	0.092	0.082	0.083	0	32.6
8:05	2.92	307.5	12.56	64	765.3	0.095	0.083	0.084	0	21.6
8:10	4.36	304.6	12.78	63.1	765.3	0.092	0.08	0.081	0	16.5
8:15	4.17	292.1	12.78	62.6	765.4	0.088	0.076	0.078	0	11.3
8:20	2.83	289.7	12.89	62.6	765.5	0.082	0.071	0.073	0	22.2
8:25	2.34	295.2	13.11	61.3	765.6	0.08	0.068	0.07	0	39.2
8:30	2.62	312.4	13.5	60.5	765.7	0.078	0.065	0.067	0	24.6
8:35	2.47	291.6	13.88	58.1	765.7	0.14	0.063	0.065	0	30.5

Totals	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0

Savg	3	213.8	8.26	81.5	764.5	0.145	0.135	0.134	n/a
Vavg	0	298.9	0	0	0	0	0	0	n/a

Data Recover 36.1 %

* 4

| > AUTOMI< STATION SETUPS ####### 8:40:22 |

Station ID: 1

Averaging Period: 5 Minute(s)

Current Setup Verificat Signature: 5004

Stored Setup Verificat Signature: 0

Firmware Signatur (EPROM 3883

Firmware Ver: 4.02

Hardware Ver: B

LCD Backligh Timeout Period: 10 Minute(s)

Memory Storage Days Left: 16 Day(s)

Data Pointer: = 12060
Modem Pointer: = 2970
Full Locs = 12060

Channel Identification:

Channel	1	2	3	4	5	6	7	8	PI	
Type	RWS	RWD	AT	RH	BP	no	no	no	RA	Sigma
Units	KNT	DEG	C	%RH	mmH	V	V	V	in	Deg
Mult	86.8	360	179.34	100	152.4	1	1	1	0.01	60
Offset	0.5	0	-72.89	0	660.4	0	0	0	0	0

Sigma Channel 2 RWD

Last ADA Reading ADA Not Connected
Declinatic 0 Degree(s)
TRUE Reading: 0 Degree(s)

```
ALARM          1 Monitor Channel:          1 RWS
ALARM          1 LO:              0.5 KNT
ALARM          1 HI:              0.5 KNT
ALARM          1 Type:    OFF

ALARM          2 Monitor Channel:          2 RWD
ALARM          2 LO:                0 DEG
ALARM          2 HI:                0 DEG
ALARM          2 Type:    OFF

          X6356

*
```