

Health Consultation
Chevron Chemical Co. (Ortho Division)
Orlando, Orange County, Florida
CERCLIS NO. FLD004064242

June 1995

Prepared by
Environmental Toxicology
The Florida Department of Health and Rehabilitative Services
Under a Cooperative Agreement With
Agency for Toxic Substances and Disease Registry
U.S. Public Health Service
Department of Health and Human Services

Background and Statement of Issues

The purpose of this health consultation is to interpret the results of indoor air monitoring for pesticides in two trailers adjacent to the Chevron Chemical Superfund site in Orlando, Florida. During a March 9, 1995 public meeting, two nearby residents expressed concerns that the insides of their trailers were contaminated with pesticides. We agreed to test their trailers for pesticide contamination.

The Chevron Chemical Co. (Ortho Division) Superfund site is a former pesticide formulation plant and truck repair facility in Orlando, Florida (Figures 1-3, Appendix A). Past waste disposal practices contaminated soil and ground water. Stormwater run-off carried pesticide-contaminated soil to the adjacent Armstrong Trailer Park. In 1992, the Chevron Chemical Company removed the on-site contaminated soil. In 1994, they removed the contaminated soil from the Armstrong Trailer Park. In a 1995 public health assessment (ATSDR 1995), we found the site was a public health hazard because some residents of the adjacent Armstrong Trailer Park may have unknowingly eaten small amounts of soil contaminated with the pesticide chlordane. As a result, we estimated those residents have a moderately increased risk of liver cancer. Since Chevron cleaned up the chlordane-contaminated soil at this trailer park, we estimated the remaining cancer risk from chlordane is insignificant.

On March 9, 1995 we held a public meeting at the Armstrong Trailer Park to solicit comments on the draft public health assessment. During this meeting two residents expressed concerns that the insides of their trailers were contaminated with pesticides. These two residents were concerned they had "tracked" pesticide contaminated soil into their trailers. Chevron had moved these two trailers on to the site temporarily in 1994 so they could remove chlordane contaminated soil from under and around them. We agreed to test their trailers for pesticide contamination.

We decided to test the air in these trailer as opposed to testing the dust for two reasons. First, there are comparison standards and guidelines for air concentrations but not for dust samples. Second, although incidental ingestion of contaminated dust is possible, inhalation is the more important route of exposure. On May 1, 1995 representatives from the Orange County Public Health Unit collected 4-hour composite air samples from inside the above described trailers (#25 & #26) as well as an outdoor air sample for comparison. Our laboratory in Jacksonville analyzed these three air samples for eight chlorinated pesticides using Environmental Protection Agency (EPA) method TO10. The analytical results are included in Appendix B.

Discussion

Our laboratory did not detect any pesticides in the trip blank or the outside air sample. Although the concentration of chlorpyrifos in trailer #25 was barely detectable, the laboratory estimated a concentration of 0.067 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). They

did not detect any other pesticides in trailer #25. In trailer #26, the laboratory was barely able to detect four pesticides: chlorpyrifos, alpha-chlordane, gamma-chlordane, and trans-nonachlor. They estimated their concentrations were 0.039, 0.011, 0.008, and 0.0065 $\mu\text{g}/\text{m}^3$, respectively. They did not detect any other pesticides in trailer #26. The analytical results are included in Appendix B.

Table 1. Approximate Indoor Air Pesticide Concentrations
(micrograms per cubic meter - $\mu\text{g}/\text{m}^3$)

<u>Pesticide</u>	<u>Trailer #25</u>	<u>Trailer #26</u>
chlorpyrifos	0.067	0.039
alpha-chlordane	ND	0.011
gamma-chlordane	ND	0.008
trans-nonachlor	ND	0.0065

ND - Not Detected

Chlorpyrifos - Chlorpyrifos, also known by its trade names "Dursban" and "Lorsban", is an organophosphate pesticide registered for control of insects on many food crops; for use on livestock and pets; for pest control in buildings including restaurants; and for control of lawn pests, termites, and mosquitos.

There are no ATSDR guidelines for chlorpyrifos. The Environmental Protection Agency (EPA) has estimated an oral reference dose (RfD) of 3 $\mu\text{g}/\text{kg}/\text{day}$ for chlorpyrifos (EPA 1995). An RfD is EPA's estimate of the amount of a chemical unlikely to cause non-cancer illnesses over a lifetime of exposure. Assuming a 70 kilogram adult inhales 23 cubic meters of air per day, we estimate the dose of chlorpyrifos in trailer #25 is 0.02 $\mu\text{g}/\text{kg}/\text{day}$. We estimate the dose of chlorpyrifos in trailer #26 is 0.01 $\mu\text{g}/\text{kg}/\text{day}$. These are 150 and 300 times less, respectively, than the EPA RfD. There is no evidence of chlorpyrifos causing cancer. Therefore, we do not expect any health effects from the air concentrations of chlorpyrifos found in trailers #25 or #26.

Chlordane - In 1978 EPA canceled the agricultural use of chlordane because of its danger to wildlife, its persistence in the environment, its accumulation in body fat, and concerns over cancer. Chlordane was also applied underground next to the foundation of houses to kill termites. Chlordane applied for termite control can enter houses as a vapor through cracks in the foundation or through cracks in air conditioning/heating ducts. In 1988 EPA canceled use of chlordane to control termites.

Technical grade chlordane is actually a mixture of more than 140 closely related chemicals. Chlordane is also known by its trade names "Octachlor" and "Vesicol 1068". Alpha (or cis)-chlordane, gamma (or trans)-chlordane, trans-nonachlor, and heptachlor are four of the major components of technical grade chlordane. Since their chemical and

toxicological properties are similar, we have added the concentrations of the individual chlordane components. The air concentration for total "chlordane" in trailer #26 is about $0.03 \mu\text{g}/\text{m}^3$.

There are a number of standards and guidelines for chlordane in air (Table 2). The U.S. Public Health Service, Agency for Toxic Substances and Disease Registry (ATSDR) has calculated a Minimal Risk Level (MRL) for chlordane. A MRL is an estimate of daily human exposure to a chemical likely to be without an appreciable risk of noncancer illness. An ATSDR MRL does not consider cancer. Although the chlordane concentration in trailer #26 ($0.03 \mu\text{g}/\text{m}^3$) is slightly above the ATSDR chronic (>365 day) MRL ($0.02 \mu\text{g}/\text{m}^3$), non-cancer health effects are unlikely. The ATSDR chronic MRL for chlordane is based on a 90-day rat inhalation study where there was no adverse health effects at $100 \mu\text{g}/\text{m}^3$. ATSDR used a safety factor of 5,000 to account for extrapolation from rats to humans, from high to low dose, and from intermediate-duration to chronic-duration exposure (ATSDR 1994).

EPA classifies chlordane as a "probable human carcinogen". This class is for chemicals with inadequate evidence from human studies and sufficient evidence from animal studies. The EPA and ATSDR estimate that breathing air with $0.003 \mu\text{g}/\text{m}^3$ of chlordane for 70 years may increase the chance of cancer (above the normal background rate) by one in 1 million. They base this estimate on increased rates of liver cancer in mice fed chlordane in their food (ATSDR 1994). We estimate the increased human cancer risk from breathing chlordane in trailer #26 is minimal.

The chlordane concentration in trailer #26 is within the range for average concentrations in homes treated for termites (ATSDR 1994). It is also below work place standards, Florida ambient (outdoor) air guidelines, and the National Research Council interim recommendation for military housing (ATSDR 1994).

Table 2. Selected Standards and Guidelines for Chlordane in Air

<u>Source</u>	<u>Comparison Value ($\mu\text{g}/\text{m}^3$)</u>
OSHA and NIOSH work place air standards (8 hr. average)	500
Tampa, Ft. Lauderdale, and Pinellas County, Florida guideline for ambient (outdoor) air (8 hr. average)	5
NRC interim (1992) guideline for military housing	5
Average indoor air concentration of homes treated for termites with chlordane.	0.03 - 2.0
ATSDR Minimal Risk Level (chronic duration, inhalation)	0.02
EPA Cancer Unit Risk Guideline (lifetime, inhalation)	0.003
ATSDR Cancer Risk Evaluation Guide (lifetime, inhalation)	0.003

Source: ATSDR 1994

Conclusions

1. Chlorpyrifos was the only pesticide found in the air of trailer #25. The air concentration of chlorpyrifos found in trailer #25 is unlikely to cause any illness.
2. Chlorpyrifos and chlordane were the only pesticides found in the air of trailer #26. The concentration of chlorpyrifos found in air of trailer #26 is unlikely to cause any illness. Although chlordane is a probable human carcinogen, the air concentrations of chlordane in trailer #26 are so low the increased human cancer risk is minimal. The air concentrations of chlordane in trailer #26 are unlikely to cause any noncancer illnesses.

Recommendation

Based on the above indoor air monitoring for pesticides, no further action is necessary at Armstrong Trailer Park trailers #25 and #26 at this time.

Health Consultation Author



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Biological Administrator
Environmental Toxicology
(904) 488-3385

References

- ATSDR 1994. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Chlordane (Update). ATSDR/TP-93/03.
- ATSDR 1995. Agency for Toxic Substances and Disease Registry. Public Health Assessment, Chevron Chemical Company (Ortho Division), Orlando, Orange County, Florida. May 3, 1995
- EPA 1995. Environmental Protection Agency. Integrated Risk Information System - chlorpyrifos file, on-line data base search June 15, 1995.

Appendix A

Site Maps

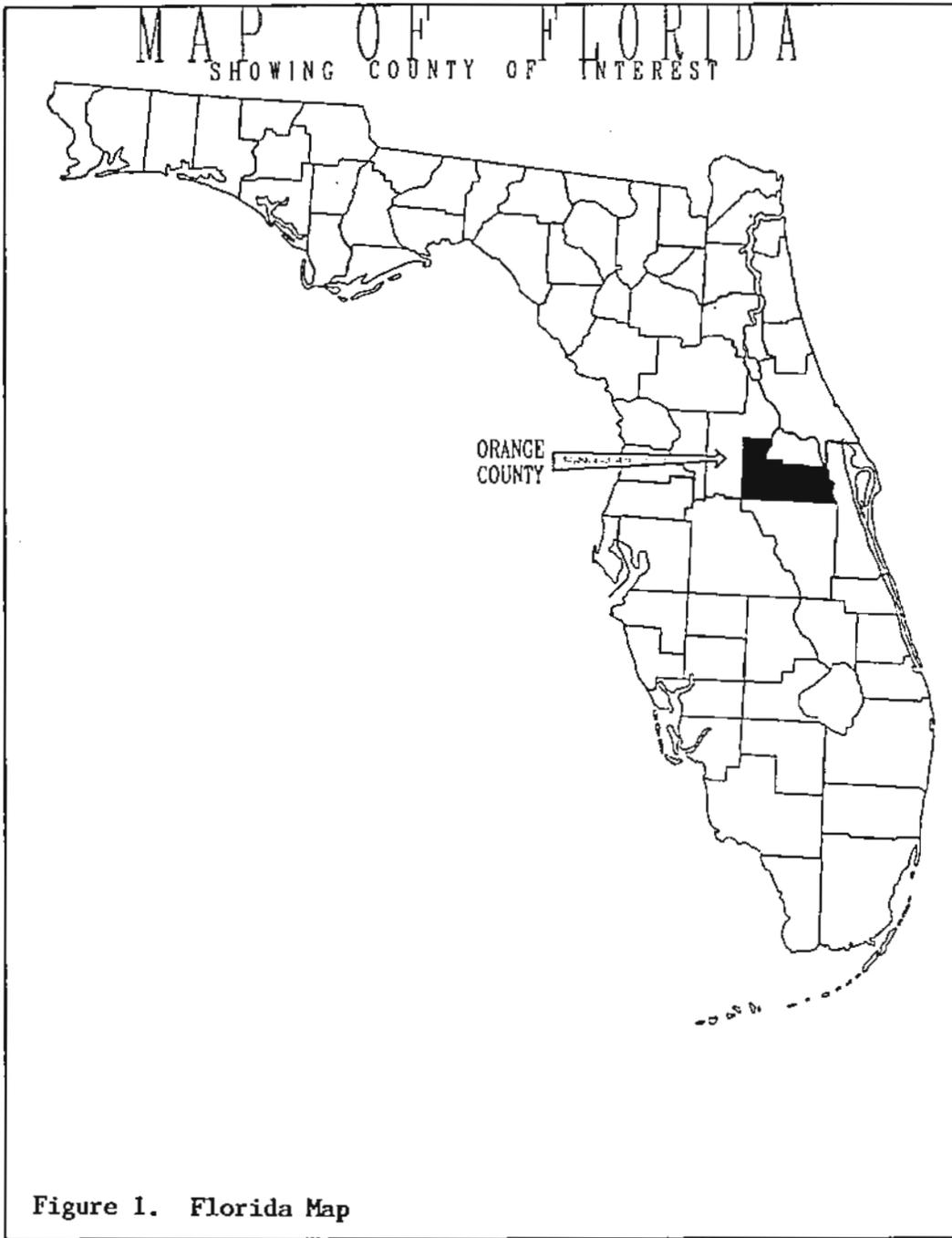
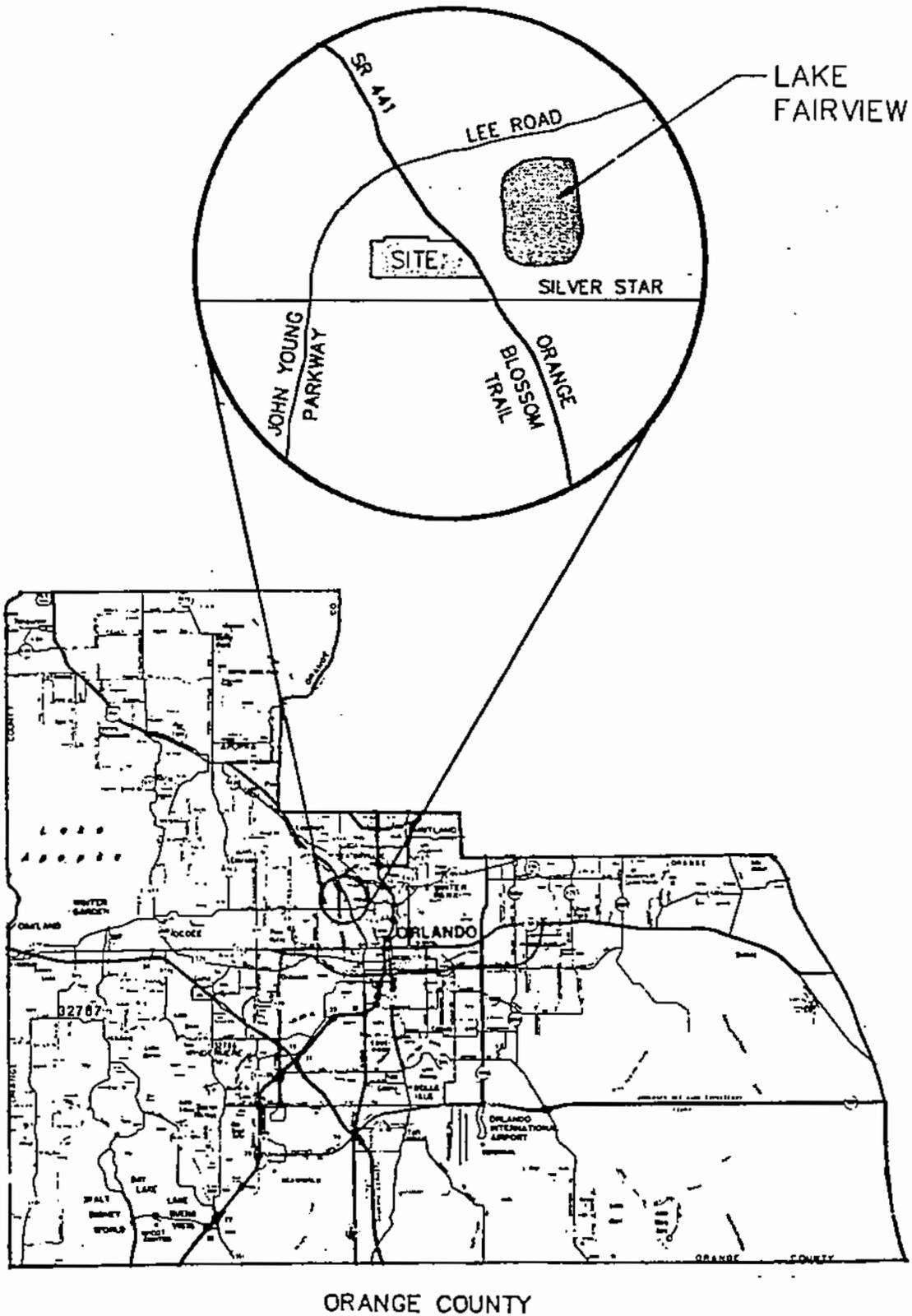


Figure 1. Florida Map



LAKE
FAIRVIEW

SITE

SILVER STAR

JOHN YOUNG
PARKWAY

LEE ROAD

ORANGE
BLOSSOM
TRAIL

ORANGE COUNTY

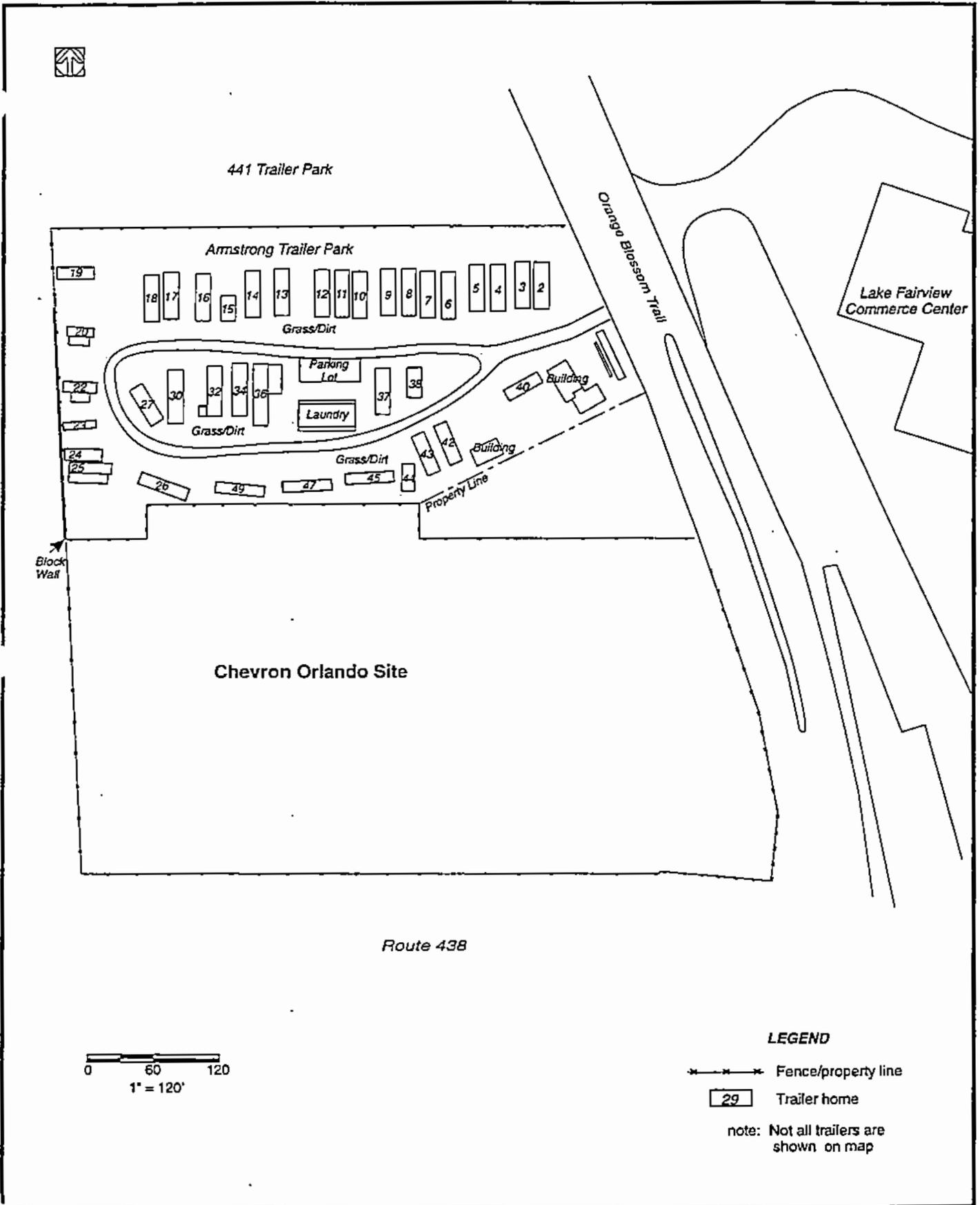


Figure 3 Study area; Chevron, Orlando site.

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Appendix B

Indoor Air Analytical Results

RECEIVED MAY 22 1995

ENVIRONMENTAL CHEMISTRY
ANALYSIS REPORT

FLORIDA DEPARTMENT OF HEALTH AND REHABILITATIVE SERVICES
OFFICE OF LABORATORY SERVICES
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JACKSONVILLE, FLORIDA 32231

LABORATORY ID 12001

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ABBREVIATIONS, TERMS, AND SYMBOLS USED:

- (1) ? = ILLEGIBLE INFORMATION ON SUBMISSION FORM
- (2) KG = KILOGRAM
- (3) G = GRAM
- (4) MG = MILLIGRAM
- (5) UG = MICROGRAM
- (6) NG = NANOGRAM
- (7) L = LITER
- (8) DL = DECILITER
- (9) ML = MILLILITER
- (10) UL = MICROLITER
- (11) CU C = CUBIC CENTIMETER
- (12) CU M = CUBIC METER
- (13) UMHO = MICROMHO
- (14) M = METER
- (15) CM = CENTIMETER
- (16) PPMV = PARTS PER MILLION BY VOLUME
- (17) PPBV = PARTS PER BILLION BY VOLUME
- (18) < = LESS THAN
- (19) > = GREATER THAN
- (20) % = PERCENT

*** A NEW REPORTING FEATURE IS THE USE OF RESULT QUALIFIERS. AN EXPLANATION OF EACH ONE USED FOR THE RESULTS OF ANALYSIS COMPONENTS APPEARS AT THE BOTTOM OF EACH SAMPLE REPORT. ***

*** PLEASE NOTE THAT RESULT VALUES INDICATED AS APPROXIMATE BY RESULT QUALIFIERS SHOULD BE REGARDED AS SUSPECT AND USED ONLY WITH DISCRETION. ***

PLEASE DIRECT QUESTIONS OR COMMENTS TO:

STEPHEN A. ARMS
(904) 791-1502 SUNCOM 866-1502

AUTHORIZED BY: sap

DATE: MAY 17 1995

PAGE :

DATE : 17-MAY-1995

PAGE :

SUMMARY REPORT FOR JOB ID ORANGE-950503-05

FOR HRS ORANGE CPHU

SAMPLE ID : 23345 / 950503-027

Sample/System Name TRIP BLANK/T010
 County Name ORANGE
 County Code 48
 Date sample taken 1-MAY-1995 00:00:09.35
 Date received 3-MAY-1995 11:22:09.35
 Matrix ID AIR
 Sample type TRIP_BLANK
 Sample priority 5
 Test Schedule. T010

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	RESULTS	UNITS	QUALIFIERS
	-----	-----	-----
ANALYSIS: [Pesticides in air / EPA T010]			
COMPONENTS: Date and time extracted.....	2-MAY-1995 15:20		
Date and time analyzed.....	3-MAY-1995 19:11		
Analyst name.....	E. HOWELL		
DIAZINON.....	0.36	ug/cu M	E
HEPTACHLOR.....	0.21	ug/cu M	E
ALDRIN.....	0.22	ug/cu M	E
CHLOPYRIPHOS.....	0.24	ug/cu M	E
OXYCHLORDANE.....	0.42	ug/cu M	E
ISOFENPHOS.....	4.5	ug/cu M	S
A-CHLORDANE.....	0.42	ug/cu M	E
G-CHLORDANE.....	0.45	ug/cu M	E
T-NONACHLOR.....	0.43	ug/cu M	E

Result Qualifier Key:

- Component not detected; QC out of range; value is the detection limit.
- Component not screened; result value is the method detection limit.

DATE : 17-MAY-1995

PAGE :

SUMMARY REPORT FOR JOB ID ORANGE-950503-05

FOR HRS ORANGE CPHU

SAMPLE ID : 23344 / 950503-026

Sample/System Name ARMSTRONG MHP/MR. BIGLOW, OWNER
Description/Comments (3) PUMP 3, OUTSIDE UNIT 25 & 26
Street Address 3220 NOBT
City ORLANDO
State. FL
5-Digit Zip Code 32805
County Name ORANGE
County Code 48
Date sample taken 1-MAY-1995 10:00:22.55
Date received 3-MAY-1995 11:14:22.55
Sample Collector W. LAND/S. THOMSON
Matrix ID AIR
Sample type COMPLAINT
Sample priority 5
Test Schedule. T010

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RESULTS

UNITS

QUALIFIERS

ANALYSIS: [Pesticides in air / EPA T010]
COMPONENTS: Date and time extracted..... 2-MAY-1995 15:20
Date and time analyzed..... 3-MAY-1995 22:13
Analyst name..... E. HOWELL

Component	Value	Unit	Qualifier
DIAZINON.....	0.36	ug/cu M	E
HEPTACHLOR.....	0.21	ug/cu M	E
ALDRIN.....	0.22	ug/cu M	E
CHLOPYRIPHOS.....	0.24	ug/cu M	E
OXYCHLORDANE.....	0.42	ug/cu M	E
ISOFENPHOS.....	4.5	ug/cu M	S
A-CHLORDANE.....	0.42	ug/cu M	E
G-CHLORDANE.....	0.45	ug/cu M	E
T-NONACHLOR.....	0.43	ug/cu M	E

Result Qualifier Key:

- E - Component not detected; QC out of range; value is the detection limit.
- S - Component not screened; result value is the method detection limit.

DATE : 17-MAY-1975

PAGE :

SUMMARY REPORT FOR JOB ID ORANGE-950503-05

FOR HRS ORANGE CPUH

SAMPLE ID : 23343 / 950503-025

Sample/System Name ARMSTRONG MHP/MR. BIGLOW, OWNER
 Description/Comments PUMP 2, KITCHEN UNIT 26
 Street Address 3220 NOBT
 City ORLANDO
 State FL
 5-Digit Zip Code 32805
 County Name ORANGE
 County Code 48
 Date sample taken 1-MAY-1995 10:00:22.55
 Date received 3-MAY-1995 11:14:22.55
 Sample Collector W. LAND/S. THOMSON
 Matrix ID AIR
 Sample type COMPLAINT
 Sample priority 5
 Test Schedule TD10

	RESULTS	UNITS	QUALIFIERS
ANALYSIS: [Pesticides in air / EPA TD10]			
COMPONENTS: Date and time extracted.....	2-MAY-1995 15:20		
Date and time analyzed.....	3-MAY-1995 21:13		
Analyst name.....	E. HOWELL		
DIAZINON.....	0.36	ug/cu M	E
HEPTACHLOR.....	0.21	ug/cu M	E
ALDRIN.....	0.22	ug/cu M	E
CHLORPYRIPHOS.....	0.039	ug/cu M	J
OXYCHLORDANE.....	0.42	ug/cu M	E
ISOFENPHOS.....	4.5	ug/cu M	S
A-CHLORDANE.....	0.011	ug/cu M	J
G-CHLORDANE.....	0.0080	ug/cu M	J
T-NONACHLOR.....	0.0065	ug/cu M	J

Result Qualifier Key:

- E - Component not detected; QC out of range; value is the detection limit.
- J - Approximate value; quantitative QC out of range.
- S - Component not screened; result value is the method detection limit.

DATE : 17-MAY-1995

PAGE :

MMARY REPORT FOR JOB ID ORANGE-950503-05

FOR HRS ORANGE CPHU

SAMPLE ID : 23342 / 950503-024

Sample/System Name ARMSTRONG MHP/MR. BIGLOW, OWNER
 Description/Comments PUMP 1, KITCHEN UNIT 25
 Street Address 3220 NOBT
 City ORLANDO
 State. FL
 5-Digit Zip Code 32805
 County Name ORANGE
 County Code 48
 Date sample taken 1-MAY-1995 10:00:22.55
 Date received 3-MAY-1995 11:14:22.55
 Sample Collector W. LAND/S. THOMSON
 Matrix ID AIR
 Sample type COMPLAINT
 Sample priority 5
 Test Schedule. TD10

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	RESULTS	UNITS	QUALIFIERS
	-----	-----	-----
ANALYSIS: [Pesticides in air / EPA TD10]			
COMPONENTS: Date and time extracted.....	2-MAY-1995 15:20		
Date and time analyzed.....	3-MAY-1995 20:12		
Analyst name.....	E. HOWELL		
DIAZINON.....	0.36	ug/cu M	E
HEPTACHLOR.....	0.21	ug/cu M	E
ALDRIN.....	0.22	ug/cu M	E
CHLORPYRIPHOS.....	0.067	ug/cu M	J
OXYCHLORDANE.....	0.42	ug/cu M	E
ISOFENPHOS.....	4.5	ug/cu M	S
A-CHLORDANE.....	0.42	ug/cu M	E
G-CHLORDANE.....	0.45	ug/cu M	E
T-NONACHLOR.....	0.43	ug/cu M	E

Result Qualifier Key:

- E - Component not detected; QC out of range; value is the detection limit.
- J - Approximate value; quantitative QC out of range.
- S - Component not screened; result value is the method detection limit.