Arkansas Water Resources Center

COMPLETION REPORT: ARKANSAS STATE PESTICIDES IN GROUND WATER MONITORING PROJECT PHASE V: VULNERABLE AREAS IN JACKSON, MONROE, LAWRENCE AND LONOKE COUNTIES

By

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I. Summary

In 1996, sixty-seven water samples were drawn from 65 wells, including 62 new wells and 3 wells sampled previously. One Woodruff County well and two Pulaski County wells were resampled. Thirty-two samples were drawn from 30 wells in Monroe County (well #1 was sampled 3 times during this phase). Ten wells in Jackson County, 12 wells in Lawrence County and 10 wells in Lonoke were also tested (Figures 1-5). With the completion of Phase V, the number of wells tested has risen to 231 with a total of 258 samples analyzed. Initially, the wells were tested for 13 pesticides and nitrate. Two more pesticides, aldicarb and carbofuran were added to the analyte list during Phase V. The analyte list is shown in Table 3. All results from all the wells are listed in Appendix A. Quality control information for these data follow the results. The "Phase V Quality Assurance Report" is included in this document as Part II.

During this phase, pesticides were detected in one new well, Monroe #1. Sampled 3 times, this well was found to contain both acifluorfen (148, 180 and 374 ug/L) and bentazon (97, 103 and 145 ug/L), a combination used commonly on soybeans. When resampled, Woodruff #11 still contained metolachlor. The reported concentration, 7.1 ug/L, was down from 13 ug/L reported two years ago. Pulaski #14 continued to show detectable, but reduced, levels of acifluorfen (9.3 ug/L), bentazon (58 ug/L) and metribuzin (1.3 ug/L). Pulaski #19, immediately adjacent to Pulaski #14, was also resampled, but for the second time no pesticides were detected.

Samples for nitrate analysis were taken from all 65 wells. Forty-six of the wells had nitrate levels less than 1 mg/L. Seventeen wells had concentrations between 1 and 10 mg./L. The maximum contaminant level (MCL) for nitrate in drinking water is 10 mg/L. Only Lawrence #5 exceeded the MCL with 11.95 mg/L.

II. Background

In 1990 the U. S. Environmental Protection Agency (EPA) released its first report on its National Pesticide Survey. The report made it clear that ground water contamination by pesticides is a wide-spread problem in the U. S. In response the EPA initiated its "Pesticides in Ground-Water Strategy" which

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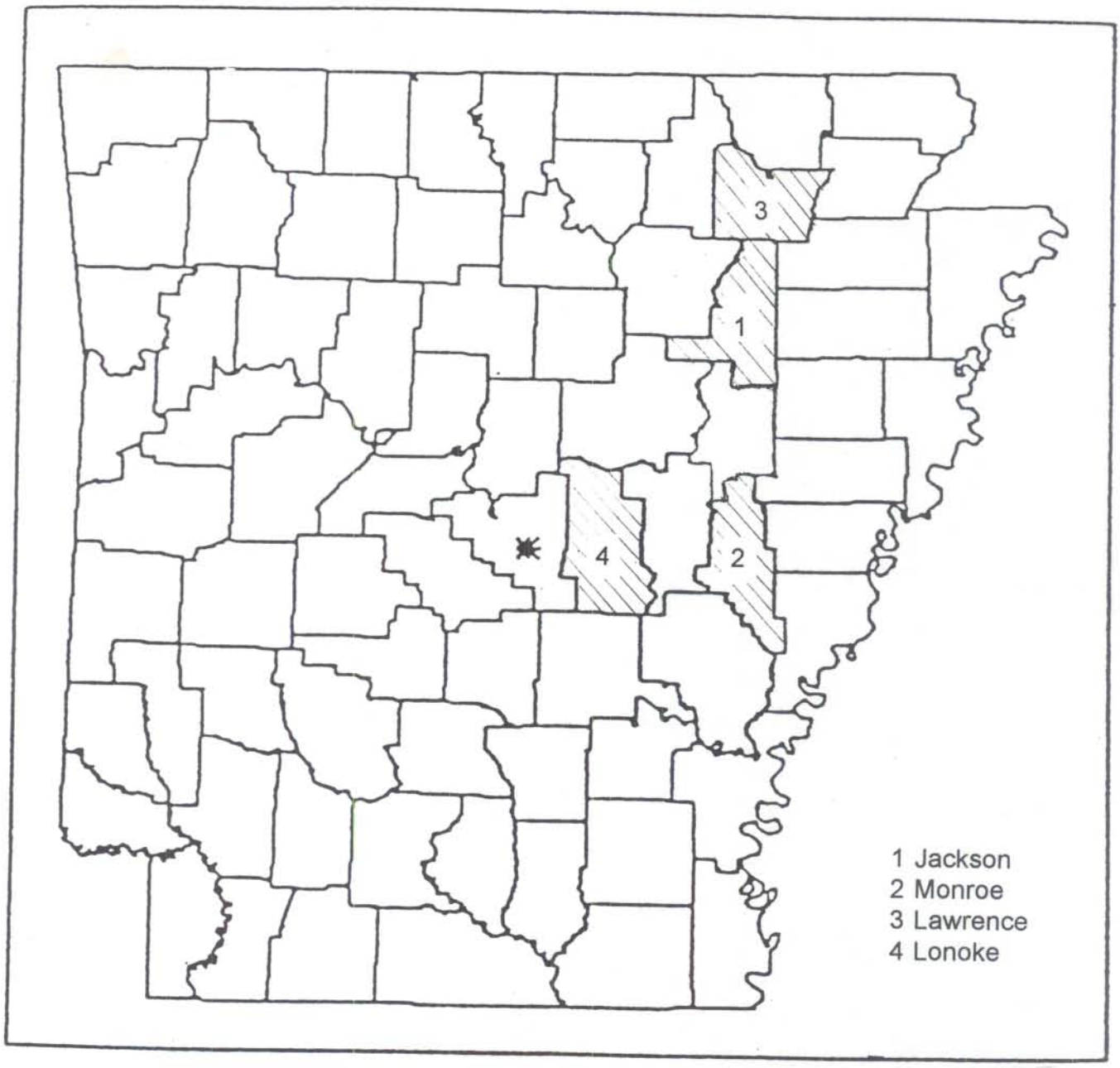

Figure 1. Counties Monitored During Phase V. (Star indicates Little Rock)

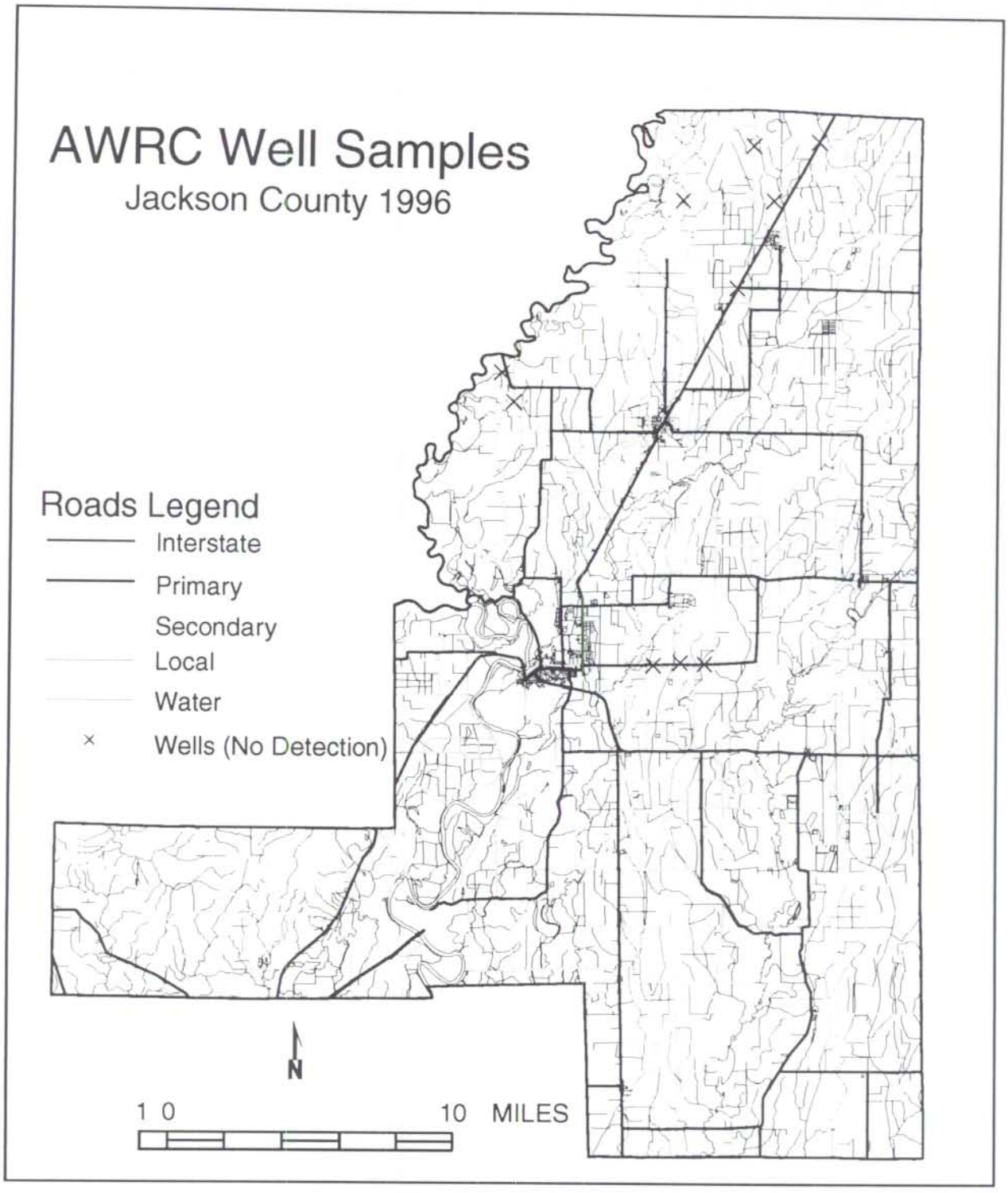

Figure 2. Monitoring Locations in Jackson County.

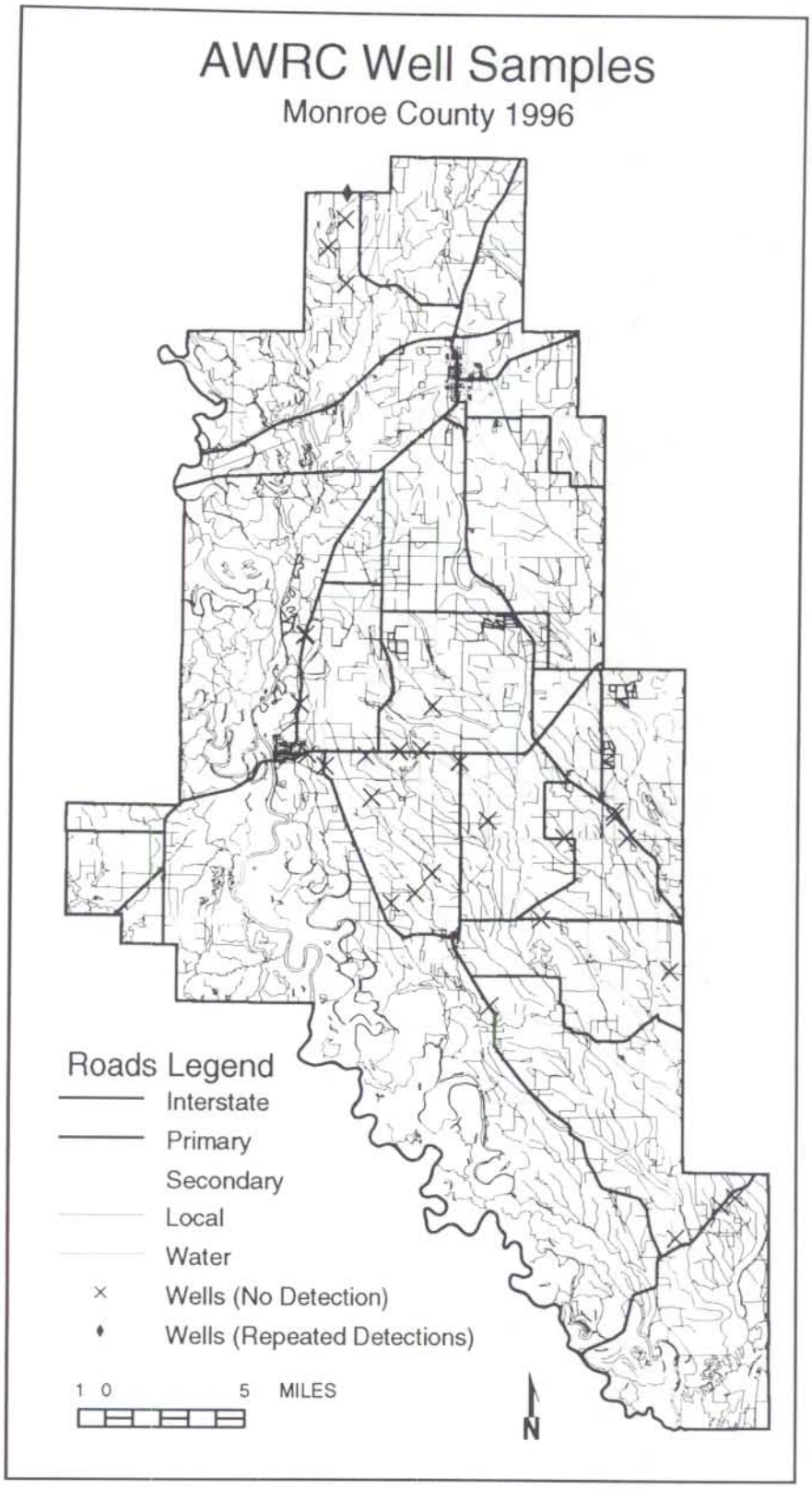

Figure 3. Monitoring Locations in Monroe County.

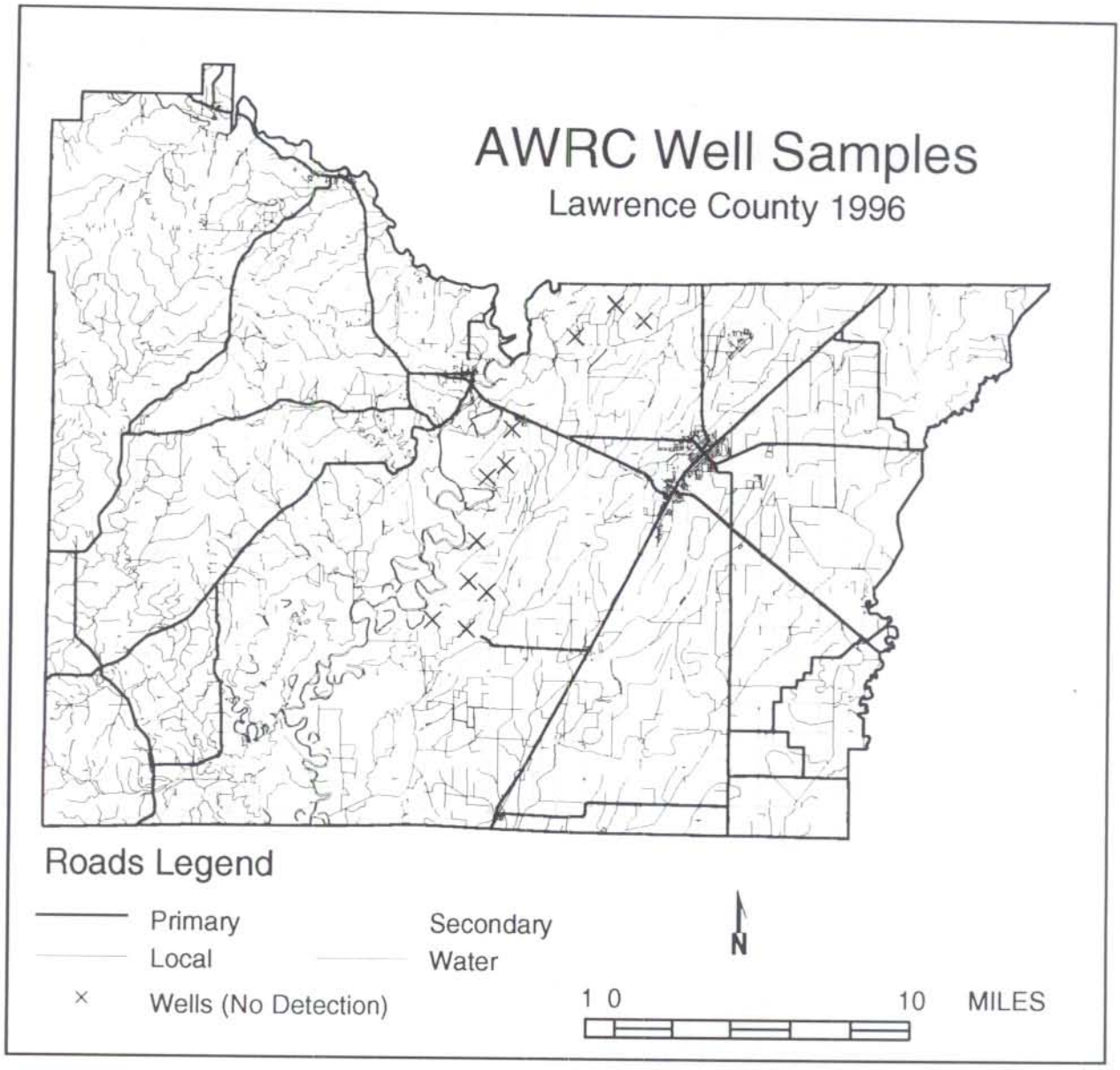

Figure 4. Monitoring Locations in Lawrence County.

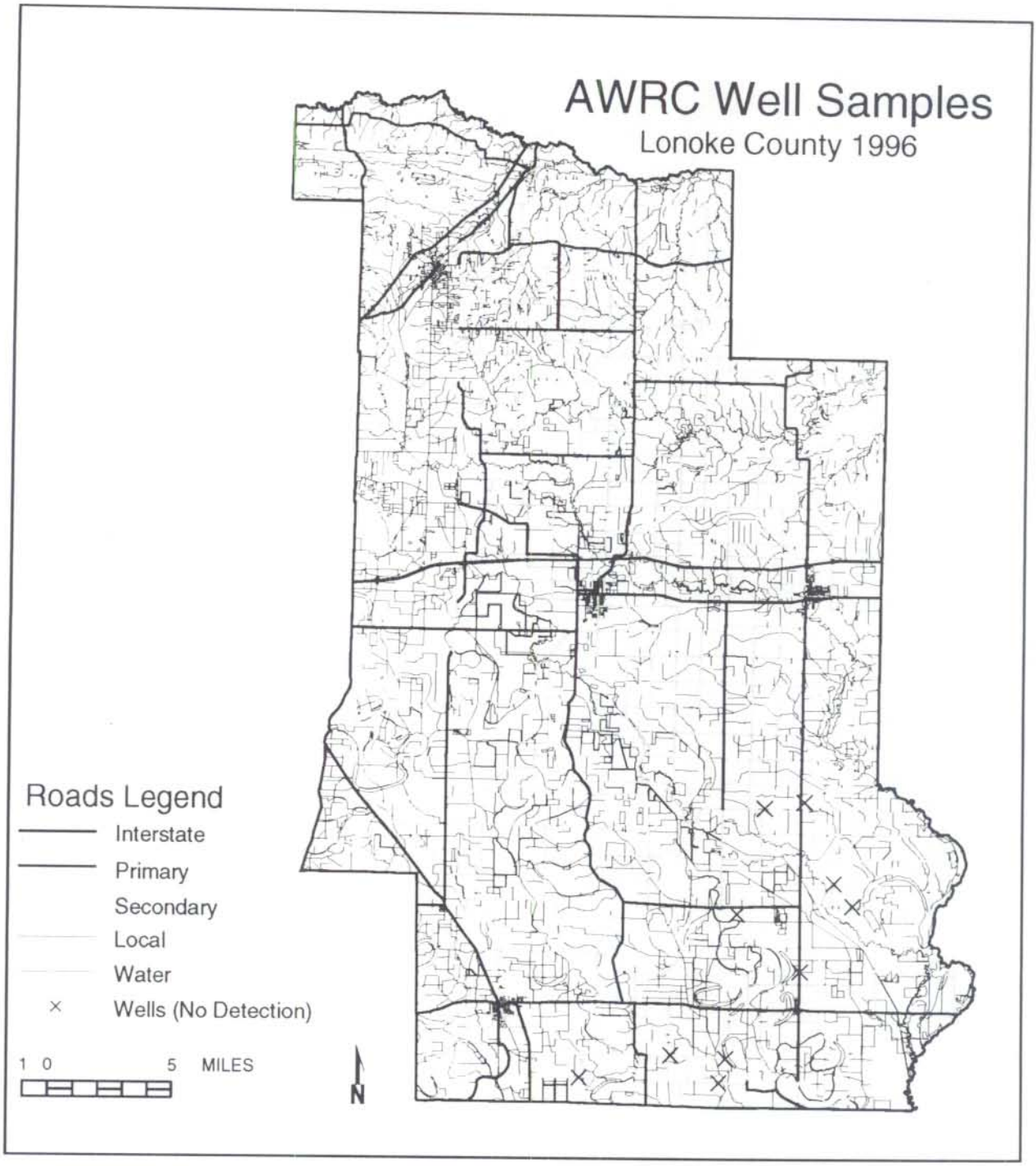

Figure 5. Monitoring Locations in Lonoke County.

included the State Management Plan (SMP) concept (EPA,1991). Arkansas completed its generic SMP--The Arkansas Agricultural Chemical Ground-Water Management Plan--in 1992. The SMP called for monitoring of ground water for pesticides in those areas of the state thought to be most vulnerable.

With the Arkansas State Plant Board (ASPB) as lead agency, monitoring under the SMP began in September, 1992. Four phases of monitoring have been carried out, prior to this phase. Table 1 shows the counties and the number of wells tested during the first 4 phases of monitoring.

Table 1. Areas Monitored During Phases I-IV.

County	Number of Wells	Number of Samples
Ashley	16	21
Chicot	6	6
Drew	1	2
Mississippi	15	16
Craighead	12	13
Poinsett	10	11
Woodruff	60	72
Pulaski	19	20
Lonoke	2	2
Lee	11	11
Crittenden	1	1
Jackson	16	16
Total	169	191

Table 2 contains a summary of pesticide detections to date. Thirteen wells out of 169 tested before Phase V were found to be contaminated, at least temporarily, with one or more pesticides. But, with the exception of three wells in Woodruff County and Pulaski #14, all the detections were small, less than 5 parts per billion. Bentazon (sold under the name 'Basagran') was the most frequently detected chemical, as well as having been found in the highest concentrations. It is used extensively for soybean production.

III. The Study Area

Phase IV and V of the monitoring program covered a broader area of the state than any of the previous phases. In the first three phases one county or an area consisting of parts of several counties was chosen for monitoring. Samples were then taken from both vulnerable and non-vulnerable parts of the designated area. Prior to Phase IV a decision was made to concentrate on the remaining vulnerable areas in eastern Arkansas, to the exclusion

Table 2. Pesticide Detections during Phases I-V.*

Well ID#	Date(s) Sampled	Chemical	Conc. (µg/L)
Drew #1	Apr. 22, 1993	Metolachlor	0.7
	May 20, 1993	no detection	
Miss #4	Nov. 2, 1993	Bentazon	2.5
Miss #5	Nov. 2, 1993	Bentazon	0.3
	Mar. 29, 1994	no detection	
CH #4	Nov. 22, 1993	Fluometuron	0.5
	Mar. 29, 1994	no detection	
Poin #1	Dec. 6, 1993	Bentazon	0.2
	Mar. 29, 1994	no detection	
Wood #7	May 23, 1994	Bentazon	55
	June 29, 1994	Bentazon	66
		Fluometuron	0.4
	July 27, 1994		
	inside	Bentazon	78
	outside	Bentazon	69
	May 15, 1995	Bentazon	21
	Oct. 12, 1995	Bentazon	38
Wood #9	May 24, 1994	Bentazon	25
		Acifluorfen	1.7
		Fluometuron	0.9
	June 29, 1994	Bentazon	88
		Acifluorfen	8.6
		Fluometuron	0.8
	May 15, 1995	Bentazon	37
		Acifluorfen	6.8
		Fluometuron	0.4
	Oct. 12, 1995	Bentazon	26
		Acifluorfen	4
Wood #11	Jul. 26, 1994	Metolachlor	13
	Feb. 20, 1995	Metolachlor	11.5
	July 10, 1996	**Metolachlor**	**7.1**
Wood #25	Sep. 15, 1994	Bentazon	4.4
	Feb. 20, 1995	Bentazon	1.9
Wood #26	Sep. 15, 1994	Bentazon	1.5
	Feb. 20, 1995	Bentazon	0.9
Wood #29	Sep. 29, 1994	Metribuzin	0.4
	Feb. 20, 1995	Metribuzin	0.4
Wood #34(PB)	Feb. 20, 1995	Alachlor	1.5
	May 15, 1995	Bentazon	1.5
		Acifluorfen	0.5

*Phase V detections shown in bold face type.

Table 2. Pesticide Detections during Phases I-V (continued).*

Pulaski #14	Jun. 19, 1995	Acifluorfen	27
		Bentazon	135
		Fluometuron	24
		Metribuzin	4
	Sep. 28, 1995	Acifluorfen	11
		Bentazon	57
		Fluometuron	19
		Metribuzin	2
	Feb. 18, 1996	**Acifluorfen**	**9.3**
		Bentazon	**58**
		Metribuzin	**1.3**
Monroe #1	**Mar. 28, 1996**	**Acifluorfen**	**148**
		Bentazon	**97**
	Apr. 17, 1996	**Acifluorfen**	**180**
		Bentazon	**103**
	June 17, 1996	**Acifluorfen**	**374**
		Bentazon	**145**

*Phase V detections shown in bold face type.

of the less vulnerable areas. This policy has continued through Phase V.

To identify areas where the ground water is vulnerable to pesticide contamination, a vulnerability map for the Arkansas Delta was developed using a combination of pesticide DRASTIC and pesticide use information. DRASTIC (Aller, et al., 1987) is a method for determining areas sensitive to ground-water contamination developed for EPA.

DRASTIC determines ground-water sensitivity to contamination based on seven factors:

Depth to Ground Water
net **R**echarge
Aquifer media
Soil media
Topography
Impact of the vadose zone, and
hydraulic **C**onductivity

The Arkansas Soil and Water Conservation Commission (ASWCC) coordinated development of the vulnerability map for Arkansas (Fugitt, 1992). For this purpose estimates of pesticide use in the various counties was provided by the Arkansas Cooperative Extension Service (CES).

The vulnerability map of the Arkansas Delta indicates that the alluvial aquifers underlying the major river basins are highly vulnerable to contamination. These rivers wander in and out of various counties. For example, Woodruff County is bisected by the Cache River which then continues southward through Monroe County before joining the White River. North of Woodruff County the Cache runs through part of Jackson County where it parallels the Black River, another tributary of the White River. Based on the model, the alluvium underlying the Black and Cache Rivers is highly vulnerable.

East of Crowley's Ridge, the St. Francis River basin is also underlain by highly vulnerable alluvial deposits. Phase II monitoring in Mississippi, Craighead and Poinsett Counties was mainly in the St. Francis basin. Another major river basin is the Arkansas River Basin. The alluvial deposits of the Arkansas River stretch from eastern Pulaski County southeastward through Lonoke, Jefferson, Lincoln and Desha Counties.

Prior to beginning Phase IV, it was decided to evaluate the remaining areas of these basins as soon as possible. Phase IV monitoring was conducted mainly in Pulaski (Arkansas River Basin), Lee (lower St. Francis) and Jackson (Cache and Black Rivers) Counties. In Phase V monitoring continued in Jackson County before turning south to Monroe County, also in the Cache River Basin. Thereafter, two monitoring trips were conducted in Lawrence County along the Black River. The final 10 samples in Phase V were collected in southern Lonoke County between Bayou Meto and the Arkansas River.

Jackson County is underlain by alluvial deposits from the interior highlands on the northwest to the Cache River on the southeast. The Black River cuts diagonally across this area from the northeast to the southwest where it joins the White River at Newport. Water in the alluvial aquifer generally follows the ground surface and runs from north to south (Broom, 1981). Water levels average about 20 feet below the land surface and fluctuate about 10 feet. Fluctuations are due to changes in pumping and recharge as the seasons change (Albin, 1967). The principal crops are wheat, soybeans, cotton, grain sorghum and rice.

Monroe County is bounded on the south and south-west by the White River which runs into the White River National Wildlife Refuge at the extreme southern end of the county. Bayou DeView runs from north to south about in the center of the county until it joins with the Cache River north of Clarendon. Bordering the west side of the county on its northern end, the Cache River flows south, finally joining with the White River at Clarendon. The eastern part of the county is drained by various creeks, sloughs and slashes which eventually run south into the White River. The alluvial plain underlies the entire county and also flows in a southerly direction (Broom, 1981). Ground water is

shallow and plentiful. Wheat, rice, soybeans and cotton are all grown in Monroe County.

Lawrence County, just north of Jackson County, lies across the fall line which divides the interior highland of Arkansas from the coastal plain. Joined by the Spring River at the north end of the county, the Black River parallels the fall line. Areas sensitive to ground water contamination are found along the length of the Black River in Lawrence County. These areas are all underlain by alluvial deposits. The water level in these deposits is generally less than 20 feet with little annual fluctuation (Lamonds, 1969). In general ground water movement is parallel with and toward the major streams. For most of the year the Black River is a receiving stream in Lawrence County (Lamonds, 1969). Wheat, rice, soybeans, corn and grain sorghum were the major crops observed during monitoring.

Lonoke County, though further south and west, also grows all the major crops including some cotton. Like Pulaski County, Lonoke County is flat with slow moving ditches and bayous providing drainage south into the Arkansas River. It is dotted with oxbow lakes and cypress swamps left behind by the meanderings of the Arkansas River and its tributaries. Ground water levels in the southern part of the county where Phase V monitoring was conducted are deeper than in the other counties monitored. Provided by the Arkansas Water Well Commission, logs for three wells drilled in 1979, 1990 and 1996 indicate static water level at 50, 52 and 45 feet, respectively.

IV. Monitoring Results

The areas described were monitored for nitrate and 13 commonly used pesticides that have high potential to migrate to ground water. Table 3 lists the pesticides analyzed during this study along with the methods used. Estimated detection limits for each pesticide are also shown. These pesticides were chosen because of their extensive use in Eastern Arkansas, their high leaching potential and their long half-life in soil. Solubility, half-life, adsorption coefficient (K_{oc}), and leaching potential were taken from the Arkansas State Plant Board (Nichols and Wilkes, 1992) which is based on data from CES.

Table 3 also includes two insecticides which were added to the list of analytes during the study. These are aldicarb and carbofuran. Forty-two of the samples were tested for these two compounds.

Displayed above, Table 2 contains a listing of the contaminated wells tested during all phases of monitoring including Phase V. Sampling dates and concentrations detected are also listed. Of the 65 wells tested in Phase V, 3 were found

Table 3. Phase V Analytes.

Compound	Source/Method	Matrix	Units	EDL
Metolachlor	EPA/507.1	groundwater	ug/L	0.75
Alachlor	EPA/507.1	groundwater	ug/L	0.38
Molinate	EPA/507.1	groundwater	ug/L	0.15
Atrazine	EPA/507.1	groundwater	ug/L	0.13
Metribuzin	EPA/507.1	groundwater	ug/L	0.15
Norflurazon	EPA/507.1	groundwater	ug/L	0.50
Linuron	NPS/4	groundwater	ug/L	0.25
Flumeturon	NPS/4	groundwater	ug/L	0.10
Cyanazine	NPS/4	groundwater	ug/L	0.58
Diuron	NPS/4	groundwater	ug/L	0.070
2,4-D	EPA/515.2	groundwater	ug/L	0.20
Bentazon	EPA/515.2	groundwater	ug/L	0.20
Acifluorfen	EPA/515.2	groundwater	ug/L	0.096
	(new chemicals)			
Aldicarb	Ohmicron Rapid Assay	groundwater	ug/L	0.25
Carbofuran	Ohmicron Rapid Assay	groundwater	ug/L	0.056

to contain trace levels of pesticide. Two of the wells were resamples of wells tested previously. Pulaski #14 had been tested twice before (Table 2). Bentazon detected at 58 ug/L is down from 135 ug/L. Acifluorfen is down from 27 ug/L to 9.3 ug/L. Fluometuron, originally detected at 24 ug/L was not detected at all in this sample. Metribuzin, originally measured at 4 ug/L, was detected at a low concentration (1.2 ug/L) at the AWRC-Water Quality Laboratory, but was not confirmed by the ASPB laboratory.

The second resample came from Woodruff #11. During phase III, Woodruff #11 had been found to be contaminated with metolachlor at 13 ug/L. Six months later the verification sample indicated metolachlor at 11.5 ug/L. The current sample was taken a year after the second sample and metolachlor was still detectable in the water at 7.5 ug/L (with the ASPB laboratory confirming the detection at 13 ug/L). Metolachlor has persisted in this well for 18 months.

The new well, Monroe #1, showed substantial levels of two pesticides, bentazon (97 ug/L) and acifluorfen (148 ug/L). The well was tested 3 times during Phase V. Each time the pesticide concentrations had increased. The concentrations reported from the final sample (acifluorfen, 374 ug/L and bentazon, 145 ug/L) are both higher than any previously reported concentration for any pesticide in ground water in Arkansas. A joint effort by the

ASPB and the Arkansas Department of Pollution Control and Ecology is now underway to investigate this site.

Table 5 shows the distribution of nitrate in the 62 new wells tested during Phase V. The MCL for nitrate in drinking water is 10 mg/L. Only one well, Lawrence #5, exceeded the MCL with 11.95 mg NO_3-N/L. A total of 17 wells, or 27%, had nitrate levels above 1 mg/L. This is similar to results obtained in the previous phases where about 30% of wells had elevated (greater than 1 mg/L) nitrate concentrations.

Table 5. Nitrate Distribution.

Concentration (mg/L, NO_3-N)	**Number of Wells**
less than 0.01 (below detection limit)	22
0.1 to 0.99	23
1.0 to 4.99	10
5.0 to 9.99	6
10.0* or more	1
Total	62

V. Conclusions

During this monitoring phase, only 1 well out of 62 new wells tested had detectable levels of pesticides. This does not indicate wide-spread pesticide contamination. Another well, located less than 1 mile down gradient from Monroe#1, was sampled and no pesticides were detected. The contamination in Monroe #1 is probably not due to normal use of pesticides. A pesticide leaching slowly through the ground would rarely, or never, result in such a high concentration in ground water. The rapid increases in pesticide concentrations would not be expected either. It is expected that aquifer contamination resulting from normal use would cause pesticide concentrations in a well to increase slowly.

With the completion of Phase V, 231 wells have been monitored for pesticides. Fourteen of these wells, or 6%, had detectable levels of one or more pesticides. Four of the 14 wells had negative verifications leaving only 10 wells with persistent contamination-about 4.3%. As the monitoring program

continues, no evidence has been found to indicate that contamination resulting from normal use of pesticides has occurred.

Sixty-seven of 228 wells for which nitrate data were reported had nitrate levels in excess of 1 mg/L. This is just over 29%. Nitrate contamination is much more common in ground water than pesticide contamination. Though these data are not positive proof, it seems likely that this contamination is not the result of spills or other accidents at the wellheads. Rather, septic tanks and the normal use of commercial fertilizers are the most likely sources of this contamination. It is not possible to distinguish between these two sources and the locations of most of the shallow wells relative to septic tanks is unknown. In some of the areas monitored, native nitrate may also be a factor. From the data in hand, there is no way to determine which sources are causing the elevated nitrate levels.

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QUALITY ASSURANCE REPORT

ARKANSAS STATE

PESTICIDES IN GROUND WATER

MONITORING PROJECT

PHASE V: VULNERABLE AREAS

(JACKSON, MONROE, LAWRENCE AND LONOKE COUNTIES)

QUALITY ASSURANCE REPORT: ARKANSAS STATE PESTICIDES IN GROUND WATER MONITORING PROJECT PHASE V: VULNERABLE AREAS (JACKSON, MONROE, LAWRENCE AND LONOKE COUNTIES)

T. Nichols, P. Vendrell, K. Steele[1]

I. Introduction

In 1996, sixty-seven water samples were drawn from sixty-five wells in various Arkansas counties. Ten samples were taken in Jackson County. Thirty-two samples were drawn from 30 wells in Monroe County. Twelve wells in Lawrence County and 10 wells in Lonoke were also tested. Two Pulaski County wells and one Woodruff County well were resampled. Ten liters of water were collected from each well, providing enough water to have a sample and a field fortified sample for each of the three primary methods, as well as extra water for duplicate analysis. Table 1 shows a list of the 15 pesticides analyzed in these samples including the methods used and their estimated detection limits.

Table 1. Phase V Analytes.

Compound	Source/Method	Matrix	Units	EDL*
Metolachlor	EPA/507.1	groundwater	ug/L	0.75
Alachlor	EPA/507.1	groundwater	ug/L	0.38
Molinate	EPA/507.1	groundwater	ug/L	0.15
Atrazine	EPA/507.1	groundwater	ug/L	0.13
Metribuzin	EPA/507.1	groundwater	ug/L	0.15
Norflurazon	EPA/507.1	groundwater	ug/L	0.50
Linuron	NPS/4	groundwater	ug/L	0.25
Flumeturon	NPS/4	groundwater	ug/L	0.10
Cyanazine	NPS/4	groundwater	ug/L	0.58
Diuron	NPS/4	groundwater	ug/L	0.070
2,4-D	EPA/515.2	groundwater	ug/L	0.20
Bentazon	EPA/515.2	groundwater	ug/L	0.20
Acifluorfen	EPA/515.2	groundwater	ug/L	0.096
	(new chemicals)			
Aldicarb	Ohmicron Rapid Assay	groundwater	ug/L	0.25
Carbofuran	Ohmicron Rapid Assay	groundwater	ug/L	0.056

*Estimated Detection Limit.

Table 1 includes two insecticides which were added to the list of analytes during the study. These are aldicarb and carbofuran. Forty-two of the samples were tested for them.

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Table 2. Wells Contaminated with Pesticides.

Well ID	Date Sampled	Chemical	Conc. (µg/L)	Confirmation Conc. (µg/L)
PULASKI #14	FEB. 28	ACIFLUROFEN	9.3	a
		BENTAZON	58	48
		METRIBUZIN	1.3	none
MONROE #1	MARCH 28	ACIFLUORFEN	148	120
		BENTAZON	97	80
	APRIL 17	ACIFLUORFEN	180	358
		BENTAZON	103	150
	JUNE 17	ACIFLUORFEN	374	364
		BENTAZON	145	123
WOODRUFF #11	JULY 10	METOLACHLOR	7.1	13

a - below ASPB detection limits

Of the 65 wells tested, three were found to contain trace levels of pesticide. Two were resamples, Pulaski #14 and Woodruff # 11. The third, Monroe #1, showed substantial levels of two pesticides, bentazon and aciflurofen. The well was tested 3 times during Phase V. Table 2 shows the concentrations found in these two wells.

II. Interpretation of QC data.

During the project, eight trips were made to collect water. The samples collected on each trip were extracted and analyzed as a batch, with each batch being subdivided into three or four of the methods of analysis indicated in Table 1. The tabulated quality control data follow this format. Thus, for each sampling trip the reported analysis results are accompanied by three or four QC reports. The following paragraphs are intended as an aid in interpreting the QC data.

The major QA/QC concern of this study is to demonstrate an ongoing ability to detect small amounts of pesticides in various ground waters. For this purpose a field spike for each of the three original methods was extracted and analyzed for every well. This far exceeds the EPA recommendation of one field spike for every ten wells. Table 3 shows the concentrations of the pesticides in each of the field spikes. Consistent recoveries of the pesticides spiked into the various ground waters indicate that sample extraction and analysis are acceptable; nothing in the ground waters is preventing the detection of pesticides in the non-fortified samples and sample handling procedures are adequate to avoid pesticide degradation.

Table 3. Spiking Levels.

METHOD	PESTICIDE	CONCENTRATION (ug/L)	
		FIELD SPIKE	2X REAGENT SPIKE
507	Molinate	2.00	0.40
	Atrazine	2.06	0.41
	Metribuzin	2.10	0.42
	Alachlor	4.08	0.81
	Metolachlor	13.72	2.74
	Norflurazon	5.90	1.18
515.2	2,4-D	3.00	0.60
	Bentazon	7.21	1.44
	Aciflurofen	3.15	0.63
NPS4	Cyanazine	6.42	1.28
	Fluometuron	1.10	0.22
	Diuron	0.99	0.20
	Linuron	3.03	0.60

As a further check that small amounts of pesticide will not go unnoticed, 2X reagent water spikes (containing pesticide concentrations at about two times the estimated detection limit for the pesticide) were analyzed with most batches. Concentrations for the 2X spikes are also included in Table 2. In the QC reports, peak areas for the 2X reagent spikes are reported to demonstrate the laboratory's ability to recover and detect very small amounts of pesticides.

Recovery of a spiked pesticide from any field spike should be within the normal range of recovery for the laboratory doing the work. This laboratory has a history of successful analyses from which to determine a "normal" range of recovery for each analyte. Table 4 shows the mean recoveries and associated standard deviations for the pesticides in this study. These were derived from field spikes analyzed previously in studies of ground water in nine Arkansas counties.

The acceptable range of recovery is defined as the mean plus or minus 3 standard deviations. For example the mean recovery for molinate, for 183 spikes previously analyzed, was 86.6% with a standard deviation of 14.2% yielding an acceptable range of 43.9-129.2%. If the recovery of a particular analyte from a field spike is outside the acceptable range then the result for that analyte for that well is reported as suspect. In addition, surrogate recovery for the non-fortified samples must also fall in the normal range of surrogate recoveries which are defined in the same way. A surrogate is a pure compound not expected to be

Table 4. Summary of Spike and Surrogate Recoveries for EPA Methods 507, 515 and National Pesticide Survey Method 4.

Chemical	N	Mean (M) %	Std. Dev. (s) %	Acceptable Range (M±3s) %
EPA METHOD 507				
Molinate	183	86.6	14.2	43.9 - 129.2
Atrazine	188	95.8	15.0	50.8 - 140.7
Metribuzin	188	94.2	15.6	47.3 - 141.0
Alachlor	187	92.3	14.2	49.8 - 134.9
Metolachlor	188	97.5	12.6	59.7 - 135.5
Norflurazon	188	100.5	16.4	51.3 - 149.6
EPA507 surrogate	454	87.4	18.6	31.5 - 143.3
NPS METHOD 4				
Cyanazine	186	88.7	13.2	49.1 - 128.4
Fluometuron	185	85.5	13.2	46.0 - 124.9
Diuron	185	88.1	10.5	56.5 - 119.6
Linuron	186	83.5	10.9	50.8 - 116.2
NPS4 surrogate	438	84.8	12.4	47.7 - 121.9
EPA METHOD 515				
2,4-D	157	87.7	20.4	26.6 - 148.7
Bentazon	151	86.9	21.2	23.2 - 150.5
Aciflurofen	157	87.3	21.6	22.4 - 152.2
EPA515 surrogate	353	90.9	20.5	29.6 - 152.3

in the sample. A known amount of surrogate is added to the sample water before extraction as a check on the sample preparation and extraction procedures. The normal ranges for surrogate recoveries are also given in Table 4.

Results are reported as suspect due to matrix effects if the spike recovery or the surrogate recovery was not in the specified range. A result is also reported as suspect if recovery of the internal standard analyzed with each sample is not between 60 and 140%. The internal standard is another compound not expected to be in the sample. A known amount of the internal standard is added to each sample after extraction is complete. Acceptable recovery of the internal standard indicates that the analytical instrument is functioning properly. For drinking water samples EPA requires the internal standard recovery to be between 70 and 130%. The interval was extended to 60-140% in order to account for higher variability in our matrix, ground water. QC data is also reported on lab blanks. Every day that samples were extracted a lab blank was extracted to identify any contamination in the lab. When analyzed these blanks should contain no detectable pesticides.

Beginning with the fourth batch of samples collected during Phase V, an immunoassay screening technique was used to test each sample for aldicarb and carbofuran. The QC report which accompanies the data on aldicarb and carbofuran (labeled OHMICRON RAPID ASSAY) is different than the 3 reports discussed in the previous paragraphs. The new report contains information on the quality of the six standards, two for each of 3 different concentrations, the percent recovery for a control sample (a spiked sample provided by Ohmicron, the screening kit manufacturer) and the percent recovery for a lab matrix spike, if any. Results for the lab matrix spikes are included for the last 28 samples analyzed. Prior to that time, Ohmicron's QC recommendations were being followed. Analysis of the lab matrix spikes was added to further strengthen the QC data.

For the immunoassay tests, a coefficient of variation(%CV) is computed for each pair of standards. This is a measure of variation between the two standards. For our purposes, the %CV for each of the three pairs of standards must be 20% or less. For the control samples a recovery range of 60-140% is acceptable. Analysis of the lab matrix spike is considered acceptable if 50% or more of the spike is recovered. These figures for acceptance have been derived from previous results for the other methods. Results are reported as suspect if any of the above criteria are not met. As with the other methods, positive immunoassay results are confirmed by separate analysis.

Nitrate-nitrogen was also analyzed and reported for Phase V. QC data were collected on one sample from each sampling trip. For this a duplicate analysis was performed with a percent relative standard deviation (%RSD) less than 10% being satisfactory. A spike was also analyzed with a percent recovery from 90 to 110% required to pass.

III.QA/QC Summary.

Sampling procedures set out in the QAPP for this project were followed on all sample collection trips. Samples were iced immediately and kept iced until delivered to the lab. Sample custody forms were maintained through sample delivery and are on file with the records of this project. EPA holding times for samples and extracts were met without exception and samples and extracts were held in the lab at 4°C, or below, at all times. No detectable levels of pesticide were in any of the laboratory "blanks."

Appendix A contains analysis results and QC data for each of the eight sampling trips made during Phase V. For the sixty-seven samples there were a total of 955 data points of which only 13, or 1.4%, have been reported as suspect. The spike recoveries for all four NPS4 compounds from Monroe #1r2 were too low because the internal standard concentration was too high. In the results from the third trip to Jackson County, all the atrazine spike recoveries were twice what they should have been. No reason

for this was ever determined. Suspect results have been highlighted with grey shading on the analysis reports.

Five other data points which might have been reported as suspect were not. For Monroe #1 and Monroe #1R the spike recoveries for the two detected pesticides were out of the acceptable range as was the bentazon spike recovery for Pulaski #14r2. High pesticide concentrations in the wells overwhelmed the spikes making it impossible to accurately measure spike recovery. The results were not reported as suspect. In all cases the detections were confirmed by ASPB. The spikes were intended to assure ability to recover small concentrations of pesticides.

Being able to recover the minimum acceptable amount, or more, of the pesticides in all but 4 of the field spikes assures the researchers that no significant amounts of pesticide have gone undetected. The authors feel the QC data for these analysis results are adequate for the stated purposes of the study.

All the QC data for nitrate-nitrogen were satisfactory. However, there was no %RSD calculated for the duplicate analysis from trip #1 to Lawrence County and trip #4 to Monroe County as at least one of the duplicate measurements was below the detection limit making computation of this statistic impossible.

APPENDIX A

ANALYSIS RESULTS

AND

SPIKE RECOVERY DATA

RESULTS OF PESTICIDE MONITORING : TRIP #3TO JACKSON COUNTY-FEBRUARY, 1996. Page1

(unk = unknown, NC = not collected, ND = not detected) (= suspect, see text)

	1	2	3	4
WELL ID:	JACK # 17	JACK # 18	JACK # 19	JACK # 20
DATE SAMPLED:	26-Feb-96	26-Feb-96	27-Feb-96	27-Feb-96
LATITUDE:	35° 45' 26"	35° 44' 32"	35° 50' 37"	35° 52' 24"
LONGITUDE:	91° 18' 01"	91° 17' 35"	91° 07' 38"	91° 05' 56"
DEPTH OF WELL, ft:	20	16	30	54
pH, standard units:	5.8	6.2	7.2	6.8
CONDUCTIVITY AT 25° C , umhos/cm:	212	117	604	509
TEMPERATURE, ° C :	17.5	14	16	17
NITRATE, mg/L:	3.76	0.89	<0.01	<0.01
ACIFLUORFEN, ug/L	ND	ND	ND	ND
ALACHLOR, ug/L:	ND	ND	ND	ND
ATRAZINE,ug/L:	ND	ND	ND	ND
BENTAZON, ug/L	ND	ND	ND	ND
CYANAZINE, ug/L:	ND	ND	ND	ND
DIURON, ug/L:	ND	ND	ND	ND
FLUOMETURON, ug/L:	ND	ND	ND	ND
LINURON, ug/L:	ND	ND	ND	ND
METOLACHLOR, ug/L:	ND	ND	ND	ND
METRIBUZIN, ug/L:	ND	ND	ND	ND
MOLINATE, ug/L:	ND	ND	ND	ND
NORFLURAZON, ug/L	ND	ND	ND	ND
2,4-D, ug/L	ND	ND	ND	ND

RESULTS OF PESTICIDE MONITORING : TRIP #3 TO JACKSON COUNTY-FEBRUARY, 1996. Page 2

(unk = unknown, NC = not collected, ND = not detected) (= suspect, see text)

	5	6	7	8	9
WELL ID:	JACK # 21	JACK # 22	JACK # 23	PUL#14R2	PUL#19r1
DATE SAMPLED:	27-Feb-96	27-Feb-96	27-Feb-96	28-Feb-96	28-Feb-96
LATITUDE:	35° 52' 18"	35° 50' 39"	35° 47' 58"	34° 45' 56"	34° 45' 56"
LONGITUDE:	91° 08' 23"	91° 11' 07"	91° 09' 03"	92° 05' 42"	92° 05' 42"
DEPTH OF WELL, ft:	32	70	75	20-30	SHALLOW
pH, standard units:	7.2	7.5	7.5	6.7	6.5
CONDUCTIVITY AT 25° C , umhos/cm:	534	680	495	644	630
TEMPERATURE, ° C :	17	15	15	15	15
NITRATE, mg/L:	<0.01	0.02	<0.01	2.7	<0.01
ACIFLUORFEN, ug/L	ND	ND	ND	9.3	ND
ALACHLOR, ug/L:	ND	ND	ND	ND	ND
ATRAZINE,ug/L:	ND	ND	ND	ND	ND
BENTAZON, ug/L	ND	ND	ND	58.6	ND
CYANAZINE, ug/L:	ND	ND	ND	ND	ND
DIURON, ug/L:	ND	ND	ND	ND	ND
FLUOMETURON, ug/L:	ND	ND	ND	ND	ND
LINURON, ug/L:	ND	ND	ND	ND	ND
METOLACHLOR, ug/L:	ND	ND	ND	ND	ND
METRIBUZIN, ug/L:	ND	ND	ND	1.34	ND
MOLINATE, ug/L:	ND	ND	ND	ND	ND
NORFLURAZON, ug/L	ND	ND	ND	ND	ND
2,4-D, ug/L	ND	ND	ND	ND	ND

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO JACKSON COUNTY - FEBRUARY, 1996.

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PERCENT RECOVERIES

	SURROGATE	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON	INT. STD.
FIELD FORTIFIED SAMPLES								
JACK # 17	77	96	202	116	109	117	112	101
JACK # 18	92	106	213	124	117	127	122	92
JACK # 19	85	94	193	111	103	110	107	95
JACK # 20	75	85	180	60	97	106	103	98
JACK # 21	59	74	162	93	86	95	92	88
JACK # 22	78	86	184	106	98	106	104	98
JACK # 23	81	92	189	108	101	109	108	97
PUL#14R2	74	83	179	102	96	103	104	91

NON-FORTIFIED SAMPLES-SURROGAT AND INTERNAL STANDARD RECOVERIES

JACK # 17	85	100
JACK # 18	80	96
JACK # 19	85	94
JACK # 20	65	91
JACK # 21	67	91
JACK # 22	66	92
JACK # 23	76	81
PUL#14R2	69	87
PUL#19r1	73	82

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO JACKSON COUNTY - FEBRUARY, 1996.

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LAB BLANKS

	SURROGATE	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON	INT. STD.
2991	71							99
2992bl	68							89

CONCENTRATIONS FOR LAB BLANKS

2991	0	0	0	0	0	0
2992bl	0	0	0	0	0	0

PEAK AREAS FOR A 2X* STANDARD

	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON
2X STANDARD	41231	29951	23511	12064	47376	39685

DUPLICATE ANALYSIS

FIELD DUPLICATE - SURROGATE AREA COMPARISON

2903	2905	%RSD
505910	340469	39.09

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO JACKSON COUNTY - FEBRUARY, 1996.

PERCENT RECOVERIES

	SURROGATE	2,4-D	INT. STD	BENTAZON	ACIFLUROFEN
FIELD FORTIFIED SAMPLES					
JACK # 17	90	106	104	106	95
JACK # 18	102	111	108	113	101
JACK # 19	99	110	104	113	107
JACK # 20	101	110	105	112	107
JACK # 21	104	113	107	117	108
JACK # 22	119	98	103	99	109
JACK # 23	101	110	106	113	134
PUL#14R2	94	57	112	<0	85
PUL#19r1	127	91	104	98	111

NON-FORTIFIED SAMPLES-SURROGAT AND INTERNAL STANDARD RECOVERIES

JACK # 17	110	117
JACK # 18	86	109
JACK # 19	83	111
JACK # 20	91	105
JACK # 21	81	105
JACK # 22	94	110
JACK # 23	92	99
PUL#14R2	104	111
PUL#19r1	79	98

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO JACKSON COUNTY - FEBRUARY, 1996.

LAB BLANKS

	SURROGATE	2,4-D	INT. STD.	BENTAZON	ACIFLUROFEN
2994bl	36		102		
3081bl	105		108		

CONCENTRATIONS FOR LAB BLANKS

2994bl	0	0	0
3081bl	0	0	0

PEAK AREAS FOR A 2X* STANDARD

2,4-D	BENTAZON	ACIFLUROFEN
144241	197421	1586413

DUPLICATE ANALYSIS

FIELD DUPLICATE - SURROGATE AREA COMPARISON

2979	2977	%RSD
182919	223726	20.07

MACHINE DUPLICATE - SURROGATE AREA COMPARISON

1ST RUN	2ND RUN	%RSD
251233	273674	8.55

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO JACKSON COUNTY - FEBRUARY, 1996.

PERCENT RECOVERIES

	CYANAZINE	FLUOMETURON	DIURON	LINURON	SURROGATE	INT. STD.
FIELD FORTIFIED SAMPLES						
JACK # 17	97	93	82	86	111	105
JACK # 18	97	96	81	86	114	103
JACK # 19	99	93	83	88	114	95
JACK # 20	95	84	80	83	110	98
JACK # 21	82	77	68	71	102	101
JACK # 22	73	69	62	66	87	124
JACK # 23	93	94	84	87	106	101

NON-FORTIFIED SAMPLES-SURROGAT AND INTERNAL STANDARD RECOVERIES

JACK # 17	114	99
JACK # 18	115	97
JACK # 19	109	98
JACK # 20	110	90
JACK # 21	113	103
JACK # 22	113	96
JACK # 23	101	107
PUL#14R2	85	127
PUL#19r1	89	112

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO JACKSON COUNTY - FEBRUARY, 1996.

LAB BLANKS

SURROGATE AND INTERNAL STANDARD RECOVERIES

	CYANAZINE	FLUOMETURON	DIURON	LINURON	SURROGATE	INT. STD.
2999bl					106	97

CONCENTRATIONS FOR LAB BLANKS

2999bl	0	0	0	0

DUPLICATE ANALYSIS

FIELD DUPLICATE - SURROGATE AREA COMPARISON

2934	2935	%RSD
66764	64369	3.65

MACHINE DUPLICATE - SURROGATE AREA COMPARISON

1ST RUN	2ND RUN	%RSD
72310	74968	3.61

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO JACKSON COUNTY - FEBRUARY, 1996.

NITRATE

SPIKE RECOVERY

WELL NUMBER	% RECOVERY
JACK 18	100

DUPLICATE ANALYSIS

1ST MEASUREMENT	2ND MEASUREMENT	% RSD
3.76 mg/L	3.76mg/L	0.08%

RESULTS OF PESTICIDE MONITORING : TRIP #1 TO MONROE COUNTY-MARCH, 1996. Page1

(unk = unknown, NC = not collected, ND = not detected) (= suspect, see text)

	1	2	3	4
WELL ID:	MON# 1	MON# 2	MON# 3	MON# 4
DATE SAMPLED:	28-Mar-96	28-Mar-96	28-Mar-96	28-Mar-96
LATITUDE:	34°59'05"	34°56'14"	34°57'22"	34°58'15"
LONGITUDE:	91°15'59"	91°16'01"	91°16'44"	91°16'03"
DEPTH OF WELL, ft:	<50	<50	50	<50
pH, standard units:	6.4	5.9	5.7	7
CONDUCTIVITY AT 25° C , umhos/cm:	446	132	177	338
TEMPERATURE, ° C :	16	15	15	15
NITRATE, mg/L:	6.6	3.1	6.7	6.4
ACIFLUORFEN, ug/L	148	ND	ND	ND
ALACHLOR, ug/L:	ND	ND	ND	ND
ATRAZINE,ug/L:	ND	ND	ND	ND
BENTAZON, ug/L	97	ND	ND	ND
CYANAZINE, ug/L:	ND	ND	ND	ND
DIURON, ug/L:	ND	ND	ND	ND
FLUOMETURON, ug/L:	ND	ND	ND	ND
LINURON, ug/L:	ND	ND	ND	ND
METOLACHLOR, ug/L:	ND	ND	ND	ND
METRIBUZIN, ug/L:	ND	ND	ND	ND
MOLINATE, ug/L:	ND	ND	ND	ND
NORFLURAZON, ug/L	ND	ND	ND	ND
2,4-D, ug/L	ND	ND	ND	ND

RESULTS OF PESTICIDE MONITORING : TRIP #1 TO MONROE COUNTY-MARCH, 1996. Page 2

(unk = unknown, NC = not collected, ND = not detected) (= suspect, see text)

	5	6	7	8
WELL ID:	MON# 5	MON# 6	MON# 7	MON# 8
DATE SAMPLED:	29-Mar-96	29-Mar-96	29-Mar-96	29-Mar-96
LATITUDE:	34°45'17"	34°45'14"	34°43'05"	34°41'09"
LONGITUDE:	91°17'39"	91°17'41"	91°17'54"	91°16'56"
DEPTH OF WELL, ft:	80	80	50	30
pH, standard units:	7.4	7.4	6.3	5.9
CONDUCTIVITY AT 25° C , umhos/cm:	517	417	199	235
TEMPERATURE, ° C :	16	16	15	15
NITRATE, mg/L:	0.01	<0.01	2.6	5.9
ACIFLUORFEN, ug/L	ND	ND	ND	ND
ALACHLOR, ug/L:	ND	ND	ND	ND
ATRAZINE,ug/L:	ND	ND	ND	ND
BENTAZON, ug/L	ND	ND	ND	ND
CYANAZINE, ug/L:	ND	ND	ND	ND
DIURON, ug/L:	ND	ND	ND	ND
FLUOMETURON, ug/L:	ND	ND	ND	ND
LINURON, ug/L:	ND	ND	ND	ND
METOLACHLOR, ug/L:	ND	ND	ND	ND
METRIBUZIN, ug/L:	ND	ND	ND	ND
MOLINATE, ug/L:	ND	ND	ND	ND
NORFLURAZON, ug/L	ND	ND	ND	ND
2,4-D, ug/L	ND	ND	ND	ND

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #1 TO MONROE COUNTY - MARCH, 1996.

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PERCENT RECOVERIES

	SURROGATE	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON	INT. STD.
FIELD FORTIFIED SAMPLES								
MON# 1		79	102	96	109	93	104	121
MON# 2		70	97	93	82	88	102	100
MON# 3		82	104	60	85	91	95	106
MON# 4		76	107	95	83	89	96	108
MON# 5		80	107	91	86	91	96	103
MON# 6		79	105	90	85	91	96	101
MON# 7		82	108	91	85	92	94	98
MON# 8		78	72	75	76	92	92	99
NON-FORTIFIED SAMPLES-SURROGATE AND INTERNAL STANDARD RECOVERIES								
MON# 1	66							101
MON# 2	70							96
MON# 3	68							103
MON# 4	64							103
MON# 5	65							102
MON# 6	70							103
MON# 7	78							106
MON# 8	60							98

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #1 TO MONROE COUNTY - MARCH, 1996.

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LAB BLANKS

	SURROGATE	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON	INT. STD.
3082BL	77							105
3089 BL	63							111

CONCENTRATIONS FOR LAB BLANKS

3082BL	0	0	0	0	0	0
3089 BL	0	0	0	0	0	0

PEAK AREAS FOR A 2X* STANDARD

	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON
2X STANDARD	39646	49365	34349	15595	46687	55359

DUPLICATE ANALYSIS

FIELD DUPLICATE - SURROGATE AREA COMPARISON

3001	3003	%RSD
371952	383481	3.05

MACHINE DUPLICATE - SURROGATE AREA COMPARISON

1ST RUN	2ND RUN	%RSD
371952	369473	0.67

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #1 TO MONROE COUNTY - MARCH, 1996.

PERCENT RECOVERIES

	SURROGATE	2,4-D	INT. STD	BENTAZON	ACIFLUROFEN
FIELD FORTIFIED SAMPLES					
MON# 1		95	103	208	316
MON# 2		89	105	85	94
MON# 3		82	103	77	86
MON# 4		80	112	74	82
MON# 5		94	117	91	99
MON# 6		95	108	92	99
MON# 7		111	109	98	112
MON# 8		110	107	104	106

NON-FORTIFIED SAMPLES-SURROGATE AND INTERNAL STANDARD RECOVERIES

MON# 1	87	114
MON# 2	123	114
MON# 3	103	112
MON# 4	68	108
MON# 5	83	110
MON# 6	40	100
MON# 7	102	108
MON# 8	95	99

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #1 TO MONROE COUNTY - MARCH, 1996.

LAB BLANKS

	SURROGATE	2,4-D	INT. STD.	BENTAZON	ACIFLUROFEN
3081bl	125		111		

CONCENTRATIONS FOR LAB BLANKS

3081bl		0	0	0

DUPLICATE ANALYSIS

MACHINE DUPLICATE - SURROGATE AREA COMPARISON

1ST RUN	2ND RUN	%RSD
223576	214179	4.29

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #1 TO MONROE COUNTY - MARCH, 1996.

PERCENT RECOVERIES

	CYANAZINE	FLUOMETURON	DIURON	LINURON	SURROGATE	INT. STD.
FIELD FORTIFIED SAMPLES						
MON# 1	77	127	78	78		121
MON# 2	90	92	92	89		100
MON# 3	87	115	88	84		108
MON# 4	83	116	89	84		108
MON# 5	82	77	85	79		103
MON# 6	92	92	94	92		101
MON# 7	89	89	90	85		98
MON# 8	97	94	93	92		99

NON-FORTIFIED SAMPLES-SURROGATE AND INTERNAL STANDARD RECOVERIES

MON# 1	72.8	127
MON# 2	90	105
MON# 3	77	111
MON# 4	79	110
MON# 5	omitted	108
MON# 6	92	98
MON# 7	98	101
MON# 8	100	100

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #1 TO MONROE COUNTY - MARCH, 1996.

LAB BLANKS

SURROGATE AND INTERNAL STANDARD RECOVERIES

	CYANAZINE	FLUOMETURON	DIURON	LINURON	SURROGATE	INT. STD.
3084					88	100
3085					94	103

CONCENTRATIONS FOR LAB BLANKS

3084	0	0	0	0
3085	0	0	0	0

DUPLICATE ANALYSIS

FIELD DUPLICATE - SURROGATE AREA COMPARISON

3004	3006	%RSD
68123	73657	7.81

MACHINE DUPLICATE - SURROGATE AREA COMPARISON

1ST RUN	2ND RUN	%RSD
67947	69030	1.58

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #1 TO MONROE COUNTY - MARCH, 1996.

NITRATE

SPIKE RECOVERY

WELL NUMBER	% RECOVERY
MON 2	101%

DUPLICATE ANALYSIS

1ST MEASUREMENT	2ND MEASUREMENT	% RSD
6.64 mg/L	6.81 mg/L	2.50%

RESULTS OF PESTICIDE MONITORING : TRIP #2 TO MONROE COUNTY-APRIL, 1996. Page1

(unk = unknown, NC = not collected, ND = not detected) (▒▒▒▒▒▒▒▒ = suspect, see text)

	1	2	3	4
WELL ID:	MON# 9	MON# 10	MON# 11	MON# 12
DATE SAMPLED:	17-Apr-96	17-Apr-96	17-Apr-96	17-Apr-96
LATITUDE:	34°24'32"	34°26'11"	34°27'11"	34°27'26"
LONGITUDE:	91°04'24"	91°03'36"	91°01'52"	91°01'18"
DEPTH OF WELL, ft:	60	NOT AVAILABLE	SHALLOW	SHALLOW
pH, standard units:	6.2	6.2	6.1	6.9
CONDUCTIVITY AT 25° C , umhos/cm:	126	183	520	141
TEMPERATURE, ° C :	17	17	17	17
NITRATE, mg/L:	0.01	3.7	5.6	0.01
ACIFLUORFEN, ug/L	ND	ND	ND	ND
ALACHLOR, ug/L:	ND	ND	ND	ND
ATRAZINE,ug/L:	ND	ND	ND	ND
BENTAZON, ug/L	ND	ND	ND	ND
CYANAZINE, ug/L:	ND	ND	ND	ND
DIURON, ug/L:	ND	ND	ND	ND
FLUOMETURON, ug/L:	ND	ND	ND	ND
LINURON, ug/L:	ND	ND	ND	ND
METOLACHLOR, ug/L:	ND	ND	ND	ND
METRIBUZIN, ug/L:	ND	ND	ND	ND
MOLINATE, ug/L:	ND	ND	ND	ND
NORFLURAZON, ug/L	ND	ND	ND	ND
2,4-D, ug/L	ND	ND	ND	ND

RESULTS OF PESTICIDE MONITORING : TRIP #2 TO MONROE COUNTY-APRIL, 1996. Page 2

(unk = unknown, NC = not collected, ND = not detected) (▒▒▒▒▒▒▒▒ = suspect, see text)

	5	6	7	8
WELL ID:	MON# 1R1	MON # 13	MON # 14	MON # 15
DATE SAMPLED:	17-Apr-96	18-Apr-96	18-Apr-96	18-Apr-96
LATITUDE:	34°59'05"	34°41'27"	34°40'09"	34°41'31"
LONGITUDE:	91°15'59"	91°15'20"	91°15'07"	91°17'37"
DEPTH OF WELL, ft:	SHALLOW	60-80	<80	SHALLOW
pH, standard units:	6.3	7.3	7.1	7.3
CONDUCTIVITY AT 25° C , umhos/cm:	398	323	400	478
TEMPERATURE, ° C :	18	17	17	17
NITRATE, mg/L:	6.92	0.01	0.13	<0.01
ACIFLUORFEN, ug/L	180	ND	ND	ND
ALACHLOR, ug/L:	ND	ND	ND	ND
ATRAZINE,ug/L:	ND	ND	ND	ND
BENTAZON, ug/L	103	ND	ND	ND
CYANAZINE, ug/L:	ND	ND	ND	ND
DIURON, ug/L:	ND	ND	ND	ND
FLUOMETURON, ug/L:	ND	ND	ND	ND
LINURON, ug/L:	ND	ND	ND	ND
METOLACHLOR, ug/L:	ND	ND	ND	ND
METRIBUZIN, ug/L:	ND	ND	ND	ND
MOLINATE, ug/L:	ND	ND	ND	ND
NORFLURAZON, ug/L	ND	ND	ND	ND
2,4-D, ug/L	ND	ND	ND	ND

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #2 TO MONROE COUNTY - APRIL, 1996.

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PERCENT RECOVERIES

	SURROGATE	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON	INT. STD.
FIELD FORTIFIED SAMPLES								
MON# 9	73	83	97	93	77	92	91	110
MON# 10	73	81	93	89	73	88	89	107
MON# 11	55	73	87	83	68	83	85	108
MON# 12	66	65	82	79	67	79	78	111
MON# 1R1	72	86	104	96	111	96	92	103
MON # 13	68	79	94	90	74	89	88	100
MON # 14	59	78	95	90	76	115	90	109
MON # 15	71	72	85	83	68	81	81	104

NON-FORTIFIED SAMPLES-SURROGATE AND INTERNAL STANDARD RECOVERIES

MON# 9	79	99
MON# 10	71	104
MON# 11	76	105
MON# 12	93	91
MON# 1R1	75	106
MON # 13	76	109
MON # 14	79	110
MON # 15	73	108

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #2 TO MONROE COUNTY - APRIL, 1996.

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LAB BLANKS

	SURROGATE	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON	INT. STD.
3182bl	78							105
3187bl	69							107
3193bl	72							103

CONCENTRATIONS FOR LAB BLANKS

	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON
3182bl	0	0	0	0	0	0
3187bl	0	0	0	0	0	0
3193bl	0	0	0	0	0	0

PEAK AREAS FOR A 2X* STANDARD

	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON
2X STANDARD	48976	58270	42384	18941	58641	65614

DUPLICATE ANALYSIS

FIELD DUPLICATE - SURROGATE AREA COMPARISON

3173	3175	%RSD
440399	437083	0.76

MACHINE DUPLICATE - SURROGATE AREA COMPARISON

1ST RUN	2ND RUN	%RSD
439411	435151	0.97

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #2 TO MONROE COUNTY - APRIL, 1996.

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PERCENT RECOVERIES

	SURROGATE	2,4-D	INT. STD	BENTAZON	ACIFLUROFEN
FIELD FORTIFIED SAMPLES					
MON# 9	86	87	85	85	92
MON# 10	97	98	82	95	103
MON# 11	84	83	96	79	84
MON# 12	82	83	90	79	86
MON# 1R1	76	83	108	122	230
MON # 13	83	88	89	86	89
MON # 14	102	89	94	82	85
MON # 15	88	92	98	87	101

NON-FORTIFIED SAMPLES-SURROGAT AND INTERNAL STANDARD RECOVERIES

MON# 9	87	102
MON# 10	94	103
MON# 11	70	104
MON# 12	80	99
MON# 1R1	50	105
MON # 13	69	96
MON # 14	115	94
MON # 15	138	101

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #2 TO MONROE COUNTY - APRIL, 1996.

LAB BLANKS

	SURROGATE	2,4-D	INT. STD.	BENTAZON	ACIFLUROFEN
3188bl	67		94		
3190bl	88		109		

CONCENTRATIONS FOR LAB BLANKS

3188bl	0	0	0
3190bl	0	0	0

PEAK AREAS FOR A 2X* STANDARD

2,4-D	BENTAZON	ACIFLUROFEN
114110	268935	966529

DUPLICATE ANALYSIS

FIELD DUPLICATE - SURROGATE AREA COMPARISON

P3149	P3140	%RSD
34501	43094	22.15

MACHINE DUPLICATE - SURROGATE AREA COMPARISON

1ST RUN	2ND RUN	%RSD
206188	218658	5.87

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #2 TO MONROE COUNTY - APRIL, 1996.

PERCENT RECOVERIES

	CYANAZINE	FLUOMETURON	DIURON	LINURON	SURROGATE	INT. STD.
FIELD FORTIFIED SAMPLES						
MON# 9	100	104	107	108	94	108
MON# 10	107	114	112	114	111	88
MON# 11	93	95	108	105	104	92
MON# 12	95	100	102	105	109	96
MON# 1R1	146	248	161	165	155	61
MON # 13	93	101	103	108	107	93
MON # 14	64	74	78	86	91	107
MON # 15	82	72	81	82	84	115

NON-FORTIFIED SAMPLES-SURROGAT AND INTERNAL STANDARD RECOVERIES

MON# 9					102	101
MON# 10					91	110
MON# 11					98	107
MON# 12					99	107
MON# 1R1					74	142
MON # 13					101	101
MON # 14					105	94
MON # 15					103	96

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #2 TO MONROE COUNTY - APRIL, 1996.

LAB BLANKS

SURROGATE AND INTERNAL STANDARD RECOVERIES

	CYANAZINE	FLUOMETURON	DIURON	LINURON	SURROGATE	INT. STD.
3181bl					96	110
3184bl					106	99

CONCENTRATIONS FOR LAB BLANKS

3181bl	0	0	0	0
3184bl	0	0	0	0

PEAK AREAS FOR A 2X* STANDARD

CYANAZINE	FLUOMETURON	DIURON	LINURON
2701	1137	3027	8709

DUPLICATE ANALYSIS

FIELD DUPLICATE - SURROGATE AREA COMPARISON

P3144	P3145	%RSD
76962	72103	6.52

MACHINE DUPLICATE - SURROGATE AREA COMPARISON

1ST RUN	2ND RUN	%RSD
72878	70549	3.25

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #2 TO MONROE COUNTY - APRIL, 1996.

NITRATE

SPIKE RECOVERY

WELL NUMBER	% RECOVERY
MON 10	101%

DUPLICATE ANALYSIS

1ST MEASUREMENT	2ND MEASUREMENT	% RSD
<0.01 mg/L	<0.01 mg/L	NC

RESULTS OF PESTICIDE MONITORING : TRIP #3 TO MONROE COUNTY-MAY, 1996. Page1

(unk = unknown, NC = not collected, ND = not detected) ([redacted] = suspect, see text)

	1	2	3	4
WELL ID:	MON # 16	MON # 17	MON # 18	MON # 19
DATE SAMPLED:	8-May-96	8-May-96	8-May-96	8-May-96
LATITUDE:	34°41'35"	34°41'36"	34°41'14"	34°39'23"
LONGITUDE:	91°14' 02"	91°13'10"	91°11'41"	91°10'37"
DEPTH OF WELL, ft:	80	80	60-70	50
pH, standard units:	7.8	7.6	7.8	7.4
CONDUCTIVITY AT 25° C , umhos/cm:	454	389	400	578
TEMPERATURE, ° C :	20	20	18	20
NITRATE, mg/L:	<0.01	<0.01	0.01	0.01
ACIFLUORFEN, ug/L	ND	ND	ND	ND
ALACHLOR, ug/L:	ND	ND	ND	ND
ALDICARB, ug/L	ND	ND	ND	ND
ATRAZINE,ug/L:	ND	ND	ND	ND
BENTAZON, ug/L	ND	ND	ND	ND
CARBOFURAN, ug/L	ND	ND	ND	ND
CYANAZINE, ug/L:	ND	ND	ND	ND
DIURON, ug/L:	ND	ND	ND	ND
FLUOMETURON, ug/L:	ND	ND	ND	ND
LINURON, ug/L:	ND	ND	ND	ND
METOLACHLOR, ug/L:	ND	ND	ND	ND
METRIBUZIN, ug/L:	ND	ND	ND	ND
MOLINATE, ug/L:	ND	ND	ND	ND
NORFLURAZON, ug/L	ND	ND	ND	ND
2,4-D, ug/L	ND	ND	ND	ND

RESULTS OF PESTICIDE MONITORING : TRIP #3 TO MONROE COUNTY-MAY, 1996. Page 2

(unk = unknown, NC = not collected, ND = not detected) (▒▒▒▒▒▒▒▒ = suspect, see text)

	5	6	7	8
WELL ID:	MON # 20	MON # 21	MON # 22	MON # 23
DATE SAMPLED:	8-May-96	9-May-96	9-May-96	9-May-96
LATITUDE:	34°37'45"	34°36'49"	34°37'08"	34°33'33"
LONGITUDE:	91°12'47"	91°14'24"	91°13'27"	91°10'38"
DEPTH OF WELL, ft:	unk	30	shallow	50
pH, standard units:	6.4	5.9	7.3	6.9
CONDUCTIVITY AT 25° C , umhos/cm:	279	104	265	221
TEMPERATURE, ° C :	20	20	19	20
NITRATE, mg/L:	0.04	1.18	<0.01	0.14
ACIFLUORFEN, ug/L	ND	ND	ND	ND
ALACHLOR, ug/L:	ND	ND	ND	ND
ALDICARB, ug/L	ND	ND	ND	ND
ATRAZINE,ug/L:	ND	ND	ND	ND
BENTAZON, ug/L	ND	ND	ND	ND
CARBOFURAN, ug/L	ND	ND	ND	ND
CYANAZINE, ug/L:	ND	ND	ND	ND
DIURON, ug/L:	ND	ND	ND	ND
FLUOMETURON, ug/L:	ND	ND	ND	ND
LINURON, ug/L:	ND	ND	ND	ND
METOLACHLOR, ug/L:	ND	ND	ND	ND
METRIBUZIN, ug/L:	ND	ND	ND	ND
MOLINATE, ug/L:	ND	ND	ND	ND
NORFLURAZON, ug/L	ND	ND	ND	ND
2,4-D, ug/L	ND	ND	ND	ND

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO MONROE COUNTY - MAY, 1996.

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PERCENT RECOVERIES

	SURROGATE	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON	INT. STD.
FIELD FORTIFIED SAMPLES								
MON # 16		84	108	93	85	96	113	113
MON # 17		96	118	103	95	107	123	116
MON # 18		79	103	87	79	91	109	110
MON # 19		84	113	95	86	96	111	111
MON # 20		83	110	95	83	96	139	115
MON # 21		74	67	72	59	103	122	100
MON # 22		83	115	100	89	101	121	113
MON # 23		81	110	94	83	95	111	113
NON-FORTIFIED SAMPLES-SURROGATE AND INTERNAL STANDARD RECOVERIES								
MON # 16	73							115
MON # 17	68							110
MON # 18	57							99
MON # 19	70							101
MON # 20	51							107
MON # 21	74							104
MON # 22	75							104
MON # 23	74							114

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO MONROE COUNTY - MAY, 1996.

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LAB BLANKS

	SURROGATE	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON	INT. STD.
3281bl	75							120
3282bl	63							109

CONCENTRATIONS FOR LAB BLANKS

	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON
3281bl	0	0	0	0	0	0
3282bl	0	0	0	0	0	0

PEAK AREAS FOR A 2X* STANDARD

	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON
2X STANDARD	44554	58337	32057	16235	51962	61787

DUPLICATE ANALYSIS

FIELD DUPLICATE - SURROGATE AREA COMPARISON

3203	3205	%RSD
456861	530736	14.96

MACHINE DUPLICATE - SURROGATE AREA COMPARISON

1ST RUN	2ND RUN	%RSD
721291	656758	9.37

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO MONROE COUNTY - MAY, 1996.

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PERCENT RECOVERIES

	SURROGATE	2,4-D	INT. STD	BENTAZON	ACIFLUROFEN
FIELD FORTIFIED SAMPLES					
MON # 16		113	87	116	108
MON # 17		107	94	109	102
MON # 18		104	91	106	98
MON # 19		64	145	64	60
MON # 20		97	95	93	86
MON # 21		118	96	111	109
MON # 22		117	101	113	116
MON # 23		126	87	122	122

NON-FORTIFIED SAMPLES-SURROGAT AND INTERNAL STANDARD RECOVERIES

MON # 16	112	94
MON # 17	67	97
MON # 18	105	96
MON # 19	123	100
MON # 20	115	93
MON # 21	91	94
MON # 22	111	101
MON # 23	103	93

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO MONROE COUNTY - MAY, 1996.

LAB BLANKS

	SURROGATE	2,4-D	INT. STD.	BENTAZON	ACIFLUROFEN
3291bl	104		89		
3293bl	120		90		

CONCENTRATIONS FOR LAB BLANKS

3291bl	0	0	0
3293bl	0	0	0

PEAK AREAS FOR A 2X* STANDARD

2,4-D	BENTAZON	ACIFLUROFEN
117777	236327	1019100

DUPLICATE ANALYSIS

FIELD DUPLICATE - SURROGATE AREA COMPARISON

3259	3250	%RSD
244726	278422	12.88

MACHINE DUPLICATE - SURROGATE AREA COMPARISON

1ST RUN	2ND RUN	%RSD
328516	325432	0.94

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO MONROE COUNTY - MAY, 1996.

PERCENT RECOVERIES

	CYANAZINE	FLUOMETURON	DIURON	LINURON	SURROGATE	INT. STD.
FIELD FORTIFIED SAMPLES						
MON # 16	92	77	94	91		114
MON # 17	90	78	90	91		109
MON # 18	80	60	78	72		112
MON # 19	90	78	91	92		106
MON # 20	94	99	103	96		102
MON # 21	93	91	94	88		100
MON # 22	96	79	97	94		100
MON # 23	80	59	82	71		115
NON-FORTIFIED SAMPLES-SURROGAT AND INTERNAL STANDARD RECOVERIES						
MON # 16					95	103
MON # 17					78	120
MON # 18					84	113
MON # 19					89	112
MON # 20					93	108
MON # 21					94	103
MON # 22					73	113
MON # 23					63	98

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO MONROE COUNTY - MAY, 1996.

LAB BLANKS

SURROGATE AND INTERNAL STANDARD RECOVERIES

	CYANAZINE	FLUOMETURON	DIURON	LINURON	SURROGATE	INT. STD.
3286bl					92	101
3288bl					89	102

CONCENTRATIONS FOR LAB BLANKS

3286bl	0	0	0	0
3288bl	0	0	0	0

PEAK AREAS FOR A 2X* STANDARD

CYANAZINE	FLUOMETURON	DIURON	LINURON
2160	754	2244	6366

DUPLICATE ANALYSIS

FIELD DUPLICATE - SURROGATE AREA COMPARISON

3214	3215	%RSD
68591	73237	6.55

MACHINE DUPLICATE - SURROGATE AREA COMPARISON

1ST RUN	2ND RUN	%RSD
65469	66061	0.90

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO MONROE COUNTY - MAY, 1996.

OHMICRON RAPID ASSAY

ALDICARB

STANDARD	%CV
1 ug/L	3.39
10	3.85
100	5.48

CONTROLS

actual	recovered	recovery ranges +/- 40%	recovery ranges +/- 60%
5 ug/L	6 ug/L	3-7 ug/L	2-8 ug/L
1.25	1	.75-1.75	.5-2.25
13.4	11.2	10.1-16.8	5.36-21.44
58	90	46.6-69.6	23.2-92.8

LAB MATRIX SPIKE

none

CARBOFURAN

STANDARD	%CV
0.1 ug/L	4.17
1	4.53
10	1.98

CONTROLS

actual	recovered	recovery ranges +/- 40%	recovery ranges +/- 60%
2ug/L	2.4 ug/L	1.2-2.8	0.8-3.2

LAB MATRIX SPIKE

none

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #3 TO MONROE COUNTY - MAY, 1996.

NITRATE

SPIKE RECOVERY

WELL NUMBER	% RECOVERY
MON 17	100

DUPLICATE ANALYSIS

1ST MEASUREMENT	2ND MEASUREMENT	% RSD
<0.01 mg/L	<0.01 mg/L	NC

RESULTS OF PESTICIDE MONITORING : TRIP #1 TO LAWRENCE COUNTY-MAY, 1996. Page1

(unk = unknown, NC = not collected, ND = not detected) (=suspect, see text)

	1	2	3	4
WELL ID:	JAC # 24	JAC # 25	JAC # 26	LAW #1
DATE SAMPLED:	29-May-96	29-May-96	29-May-96	29-May-96
LATITUDE:	35°36'27"	35°36'31"	35°36'28"	35°59'22 "
LONGITUDE:	91°12'25"	91°11'22"	91°10'26"	91°07'21"
DEPTH OF WELL, ft:	85	68	35	50
pH, standard units:	7.3	7.4	7.2	7.9
CONDUCTIVITY AT 25° C , umhos/cm:	491	577	1061	149
TEMPERATURE, ° C :	19	19	19	18
NITRATE, mg/L:	<0.01	<0.01	<0.01	3.39
ACIFLUORFEN, ug/L	ND	ND	ND	ND
ALACHLOR, ug/L:	ND	ND	ND	ND
ALDICARB, ug/L	ND	ND	ND	ND
ATRAZINE,ug/L:	ND	ND	ND	ND
BENTAZON, ug/L	ND	ND	ND	ND
CARBOFURAN,ug/L	ND	ND	ND	ND
CYANAZINE, ug/L:	ND	ND	ND	ND
DIURON, ug/L:	ND	ND	ND	ND
FLUOMETURON, ug/L:	ND	ND	ND	ND
LINURON, ug/L:	ND	ND	ND	ND
METOLACHLOR, ug/L:	ND	ND	ND	ND
METRIBUZIN, ug/L:	ND	ND	ND	ND
MOLINATE, ug/L:	ND	ND	ND	ND
NORFLURAZON, ug/L	ND	ND	ND	ND
2,4-D, ug/L	ND	ND	ND	ND

RESULTS OF PESTICIDE MONITORING : TRIP #1 TO LAWRENCE COUNTY-MAY, 1996. Page2

(unk = unknown, NC = not collected, ND = not detected) (▒▒▒▒▒▒▒▒ = suspect, see text)

	5	6	7	8
WELL ID:	LAW #2	LAW #3	LAW #4	LAW #5
DATE SAMPLED:	29-May-96	29-May-96	30-May-96	30-May-96
LATITUDE:	35°59'05"	36°00'28"	36°07'32"	36°08'27"
LONGITUDE:	91°06'07"	91°06'02"	91°02'08"	91°00'38"
DEPTH OF WELL, ft:	<50	SHALLOW	30	42
pH, standard units:	6.3	6.2	6.5	6.3
CONDUCTIVITY AT 25° C , umhos/cm:	194	176	149	230
TEMPERATURE, ° C :	17	18	18	18
NITRATE, mg/L:	9.55	<0.01	4.91	11.95
ACIFLUORFEN, ug/L	ND	ND	ND	ND
ALACHLOR, ug/L:	ND	ND	ND	ND
ALDICARB, ug/L	ND	ND	ND	ND
ATRAZINE,ug/L:	ND	ND	ND	ND
BENTAZON, ug/L	ND	ND	ND	ND
CARBOFURAN,ug/L	ND	ND	ND	ND
CYANAZINE, ug/L:	ND	ND	ND	ND
DIURON, ug/L:	ND	ND	ND	ND
FLUOMETURON, ug/L:	ND	ND	ND	ND
LINURON, ug/L:	ND	ND	ND	ND
METOLACHLOR, ug/L:	ND	ND	ND	ND
METRIBUZIN, ug/L:	ND	ND	ND	ND
MOLINATE, ug/L:	ND	ND	ND	ND
NORFLURAZON, ug/L	ND	ND	ND	ND
2,4-D, ug/L	ND	ND	ND	ND

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #1 TO LAWRENCE COUNTY - MAY, 1996.

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PERCENT RECOVERIES

	SURROGATE	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON	INT. STD.
FIELD FORTIFIED SAMPLES								
JAC # 24		84	105	95	92	101	112	90
JAC # 25		89	106	102	93	96	104	89
JAC # 26		91	109	103	92	98	109	85
LAW #1		92	113	106	94	101	112	91
LAW #2		88	109	101	92	100	112	89
LAW #3		80	104	109	93	97	110	92
LAW #4		76	93	94	83	85	94	90
LAW #5		79	101	97	98	154	102	omitted

NON-FORTIFIED SAMPLES-SURROGATE AND INTERNAL STANDARD RECOVERIES

JAC # 24	73	none
JAC # 25	90	92
JAC # 26	75	92
LAW #1	67	91
LAW #2	48	92
LAW #3	87	89
LAW #4	74	101
LAW #5	71	89

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #1 TO LAWRENCE COUNTY - MAY, 1996.

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LAB BLANKS

	SURROGATE	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON	INT. STD.
3393BL	82							92
3395 BL	72							94

CONCENTRATIONS FOR LAB BLANKS

3393BL	0	0	0	0	0	0
3395 BL	0	0	0	0	0	0

PEAK AREAS FOR A 2X* STANDARD

	MOLINATE	ATRAZINE	METRIBUZIN	ALACHLOR	METOLACHLOR	NORFLURAZON
2X STANDARD	40384	53351	40724	18704	53870	59073

DUPLICATE ANALYSIS

FIELD DUPLICATE - SURROGATE AREA COMPARISON

3303	3306	%RSD
448891	359205	22.20

MACHINE DUPLICATE - SURROGATE AREA COMPARISON

1ST RUN	2ND RUN	%RSD
393078	435158	10.16

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #1 TO LAWRENCE COUNTY - MAY, 1996.

PERCENT RECOVERIES

	SURROGATE	2,4-D	INT. STD	BENTAZON	ACIFLUROFEN
FIELD FORTIFIED SAMPLES					
JAC # 24		89	99	87	80
JAC # 25		89	106	88	84
JAC # 26		105	103	105	104
LAW #1		120	104	116	108
LAW #2		95	101	99	93
LAW #3		100	81	104	98
LAW #4		103	91	97	87
LAW #5		103	93	102	95

NON-FORTIFIED SAMPLES-SURROGAT AND INTERNAL STANDARD RECOVERIES

JAC # 24	116	98
JAC # 25	118	109
JAC # 26	87	81
LAW #1	100	103
LAW #2	98	90
LAW #3	88	79
LAW #4	89	80
LAW #5	72	66

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #1 TO LAWRENCE COUNTY - MAY, 1996.

LAB BLANKS

	SURROGATE	2,4-D	INT. STD.	BENTAZON	ACIFLUROFEN
3388bl	110		101		
3389 bl	104		84		

CONCENTRATIONS FOR LAB BLANKS

3388bl	0	0	0
3389 bl	0	0	0

PEAK AREAS FOR A 2X* STANDARD

2,4-D	BENTAZON	ACIFLUROFEN
43485	120244	409187

DUPLICATE ANALYSIS

FIELD DUPLICATE - SURROGATE AREA COMPARISON

3309	3300	%RSD
329142	167588	65.05

MACHINE DUPLICATE - SURROGATE AREA COMPARISON

1ST RUN	2ND RUN	%RSD
287904	301102	4.48

QUALITY CONTROL DATA FOR PESTICIDE MONITORING: TRIP #1 TO LAWRENCE COUNTY - MAY, 1996.

PERCENT RECOVERIES

	CYANAZINE	FLUOMETURON	DIURON	LINURON	SURROGATE	INT. STD.
FIELD FORTIFIED SAMPLES						
JAC # 24	96	89	92	90		102
JAC # 25	91	85	87	85		103
JAC # 26	87	68	81	67		100
LAW #1	94	91	90	90		104
LAW #2	98	78	94	76		90
LAW #3	92	88	90	88		102
LAW #4	97	72	92	77		99
LAW #5	100	92	114	94		100

NON-FORTIFIED SAMPLES-SURROGAT AND INTERNAL STANDARD RECOVERIES

JAC # 24	78.3	94
JAC # 25	100	96
JAC # 26	77	95
LAW #1	101	98
LAW #2	94	99
LAW #3	89	104
LAW #4	92	99
LAW #5	95	101