# APPENDIX 2

# MISSISSIPPI RIVER ALLUVIAL AQUIFER SUMMARY

# BASELINE MONITORING PROJECT, EPA FY'99

# (July 1998 Through June 1999)

# PART I

# OF

# TRIENNIAL SUMMARY REPORT

# FOR THE

# ENVIRONMENTAL EVALUATION DIVISION

# OF

# LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

**PARTIAL FUNDING PROVIDED THROUGH CWA 106 GRANT**

# MISSISSIPPI RIVER ALLUVIAL AQUIFER SUMMARY

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## BACKGROUND

To better assess the water quality of a particular aquifer at a given point in time, an attempt was made during the project year to sample all project wells producing from a common aquifer in a narrow time frame. Also, to more conveniently and economically promulgate those data collected, these aquifer summaries will make up the project Triennial Summary Report.

Figure I-1 shows the geographic locations of the Mississippi River Alluvial Aquifer and the associated project wells, whereas Table I-1 lists the wells in the aquifer along with their total depths and the use made of produced waters and the date sampled.

These data show that in July, August, September, and October of 1998, twenty-four project wells were sampled which produce from the Mississippi River Alluvial Aquifer. Of these twenty-four wells, nine are classified as Public Supply, eight are classified as Irrigation, and seven are Domestic. The wells are located in fifteen parishes that are situated along or near the Mississippi River in Louisiana.

## PROJECT FIELD AND ANALYTICAL PARAMETERS

The field parameters that are checked at each sampling site and the list of water quality parameters that are analyzed in the laboratory are shown in Table I-2. Those project inorganic (total metals) parameters analyzed in the laboratory are listed in Table I-3. These tables also show the field and analytical results determined for each analyte.

In addition to the analytical parameters mentioned above, a list of project analytical parameters that include three other categories of compounds (Volatiles, Semi-volatiles, and Pesticides/PCB's) is included. Due to the large number of analytes in these three categories, tables were not prepared for each well. However, in order for the reader to be aware of the total list of analytes, Tables I-4, I-5, and I-6 were included in this summary. These tables list the project analytes along with their Practical Quantitation Limits (PQLs) used during processing.

All results from resampling events done in the course of evaluating the quality of the Mississippi River Alluvial Aquifer are listed in Table I-7.

## DISCUSSION OF WATER QUALITY DATA

FEDERAL PRIMARY DRINKING WATER STANDARDS: Under the Federal Safe Drinking Water Act, EPA has established Maximum Contaminant Levels (MCL) for pollutants that may pose a health risk in public drinking water. An MCL is the highest level of a contaminant that EPA allows in public drinking water. MCLs ensure that drinking water does not pose either a short-term or long-term health risk. While not all wells sampled were public supply wells, this Office does use the MCLs as a benchmark for further evaluation. Laboratory data show that three project water wells in the Mississippi River Alluvial Aquifer exceeded the Federal Maximum Contaminant Level (MCL) of 50 parts per billion (ppb) for Arsenic.

CO-47 exceeded the MCL with a concentration of 56.5 ppb for Arsenic. However, in the subsequent resampling of this well, Arsenic was not detected at or above its detection limit of 1.0 ppb. Based on these further analyses, it is believed that the elevated arsenic concentration was due to field/laboratory contamination.

SL-5477Z exceeded the MCL with a concentration of 81.8 ppb for Arsenic. It is this Office's opinion that this concentration is due to the existence of Arsenic in the groundwater at this well's location. The Baseline Monitoring Project has historically found concentrations of Arsenic from this well. In April of 1992, regular Baseline Monitoring Project sampling revealed a concentration of 56.2 ppb for Arsenic. Subsequent resampling done in August of 1992 showed an Arsenic concentration of 45.5 ppb. Then, on November 14, 1995, Baseline Monitoring Project sampling revealed a concentration of 67.8 ppb for Arsenic.

IB-5427Z exceeded the MCL with a concentration of 56.5 ppb for Arsenic. It is this Office's opinion that this concentration is due to the existence of Arsenic in the groundwater at this well's location. The Baseline Monitoring Project has historically found

concentrations of Arsenic from this well. In August of 1991, analyses showed levels of Arsenic at 35.2 ppb. In November of 1995, analyses showed Arsenic at 46.7 ppb, an increase of 11.5 ppb. The 56.5 ppb concentration found in this most recent sampling event is an increase of 9.8 ppb from the previously exhibited concentration.

Laboratory data also show that ten project water wells in the Mississippi River Alluvial Aquifer exceeded the MCL of 5 ppb for Cadmium.

CO-YAKEY - 5.1 ppb

IB-289 - 5.1 ppb

AV-5135Z - 7.2 ppb, 6.4 (duplicate sample)

FR-368 - 11.0 ppb

RI-469 - 11.2 ppb, 12.6 ppb (duplicate sample)

CT-241 - 11.0 ppb

AV-DELTA - 7.3 ppb

TS-60 - 13.6 ppb

SL-5477Z - 11.6 ppb

TS-FORTENB - 15.2 ppb

In sampling events subsequent to those above and on the previous page, a trace metal grade acid was used to preserve the samples. This is because it was this Office's opinion that the exceedances were due to the grade of acid that was being used to preserve the samples. The laboratory analyses from these subsequent sampling events did not reveal the same exceedances. Also, project wells FR-368 and RI-469, two of the wells which reported Cadmium results above Cadmium's MCL, were resampled using this trace metal grade of acid as a preservative. The results for both of these sampling events showed Cadmium levels less than the detection limit of 1.0 ppb. In addition, RI-843, a well that is not in the Baseline Monitoring Project but is nearby and of similar depth to RI-469, was sampled during the resampling episodes. Cadmium was found to be less than the detection limit in the analyses for this well also. Therefore, it is the opinion of this Office that the Cadmium exceedances exhibited in the sample results from the wells mentioned above were due to the grade of acid that was being used to preserve the samples at that time.

Those project wells reporting Turbidity levels of >1 NTU, do not exceed the MCL of 1.0, as this primary standard applies to surface water systems only.

FEDERAL SECONDARY DRINKING WATER STANDARDS: EPA has set secondary standards which are defined as non-enforceable taste, odor or appearance guidelines. Field and laboratory data contained in Tables I-2 and I-3 show that twenty of the wells sampled in the Mississippi River Alluvial Aquifer exceeded the Secondary Maximum Contaminant Level (SMCL) for Iron. Ten of the wells exceeded the SMCL for Total Dissolved Solids (TDS) and thirteen wells exceeded the SMCL for Color.

IRON (SMCL=300 ppb):

CO-47 - 1,051 ppb

CO-YAKEY - 5,325 ppb

AV-CHAT - 1,355 ppb

CT-241 - 8,651 ppb

AV-DELTA - 4,783 ppb

SL-5477Z - 21,339 ppb

SMN-33 - 2,049 ppb, 1,270 ppb (duplicate sample)

IB-COM - 3,608 ppb

IB-5427Z - 1,051 ppb

IB-289 - 4,770 ppb

EB-885 -1,355 ppb

FR-368 - 5,687 ppb (from resample)

TS-60 - 9,816 ppb

TS-FORTENB - 11,017 ppb

IRON (continued):

MA-28 - 17,556 ppb

EC-370 - 14,338 ppb

WC-BRAN - 2,143 ppb

WC-91 - 3,591 ppb, 769 ppb (duplicate sample)

MO-871 - 2,115 ppb

OU-134 - 4,510 ppb

TDS (SMCL=500 ppm):

CO-YAKEY - 616 ppm

AV-CHAT - 708 ppm

AV-5135Z - 756 ppm, 756 (duplicate sample)

CT-241 -578 ppm

AV-DELTA - 1,073 ppm

FR-368 - 726 ppm

TS-60 - 532 ppm

MA-28 -554 ppm

WC-BRAN - 762 ppm

WC-91 - 580 ppm, 578 (duplicate sample)

COLOR (SMCL=15 PCU):

CO-YAKEY - 20 PCU

AV-CHAT - 20 PCU

CT-241 - 20 PCU

AV-DELTA - 20 PCU

SL-5477Z - 30 PCU

SMN-33 - 30 PCU, 30 PCU (duplicate sample)

IB-COM - 20 PCU

IB-5427Z - 20 PCU

IB-289 - 30 PCU

EB-885 - 20 PCU

TS-60 - 20 PCU

EC-370 - 20 PCU

MO-871 - 20 PCU

FEDERAL LEAD ACTION LEVEL: Under the Federal Safe Drinking Water Act, EPA has established an Action Level of 15 ppb for Lead to ensure that this contaminant does not pose either a short-term or long-term health risk in drinking water. Laboratory data contained in Table I-3 show that thirteen of the wells sampled in the Mississippi River Alluvial Aquifer exceeded the Action Level for Lead.

CO-YAKEY - 24.9 ppb

AV-CHAT - 18.7 ppb

AV-5135Z - 17.4 ppb, 16 ppb (duplicate sample)

CT-241 - 22.4 ppb

AV-DELTA - 18.4 ppb

SL-5477Z - 29.1 ppb

IB-COM - 18.2 ppb

IB-289 - 24.9 ppb

EB-885 - 18.7 ppb

FR-368 - 39.7 ppb

RI-469 - 38.8 ppb, 45.5 ppb (duplicate sample)

TS-60 - 37.4 ppb

TS-FORTENB - 43.7 ppb

In sampling events subsequent to those during which the above results were found, a trace metal grade acid was used to preserve the samples. This is because it was this Office's opinion that the exceedances were due to the grade of acid that was being used to preserve the samples. The laboratory analyses from these subsequent sampling events did not reveal the same exceedances. Also, project well RI-469, which had reported Lead results above Lead's MCL, was resampled using this trace metal grade of acid as a preservative. The sample results showed Lead levels less than the detection limit of 10.0 ppb. In addition, RI-843, a well that is not in the Baseline Monitoring Project but is nearby and of similar depth to RI-469, was sampled

during the resampling episodes. Lead was found to be < 10.0 ppb in the analyses for this well also. Therefore, it is the opinion of this Office that the Lead exceedances exhibited in the sample results from the wells mentioned above were due to the grade of acid that was being used to preserve the samples at that time.

QUANTIFIABLE CADMIUM AND LEAD VALUES: Table I-3 shows that twenty-three quantifiable values for Cadmium and nineteen quantifiable values for Lead were found in the laboratory analyses. These values are shaded in Table I-3. It is the opinion of this Office that these values are due to the grade of acid that was being used to preserve the samples at that time. For more discussion on this matter please refer to the prior sections on Cadmium and Lead MCL exceedances.

SELECTED WATER QUALITY MAPS: For the reader's convenience, maps showing the contoured values for pH, TDS, Chloride, and Iron are included in this summary report in Figures I-2 through I-5.

## SUMMARY AND RECOMMENDATIONS

In summary, the analytical data show that, with the exception of the arsenic concentrations found in the ground water located at project wells SL-5477Z and IB-5427Z, the ground water from this aquifer is of good quality when considering short-term or long-term health risks. However, this aquifer is of fair quality when considering taste, odor or appearance guidelines.

It is recommended that the several project wells assigned to the Mississippi River Alluvial Aquifer be resampled as planned, in approximately three years. In addition, several wells should be added to those currently sampled to increase the well density for this aquifer.

## Table I-1 List of Project Wells Sampled

| MISSISSIPPI RIVER ALLUVIAL AQUIFER PROJECT WELLS | | | | | | | |
|---|---|---|---|---|---|---|---|
| *PROJECT NUMBER* | *PARISH* | *WELL NUMBER* | *DATE SAMPLED* | *WELL OWNER* | *DEPTH (feet)* | *WELL USE* | *AQUIFER* |
| 199518 | AVOYELLES | AV-5135Z | 07/14/1998 | PRIVATE OWNER | 110 | DOMESTIC | MISS. RIVER ALLUVIAL |
| 199517 | AVOYELLES | AV-CHAT | 07/14/1998 | PRIVATE OWNER | 75 | IRRIGATION | MISS. RIVER ALLUVIAL |
| 199802 | AVOYELLES | AV-DELTA | 07/21/1998 | LA DELTA PLANTATION | 135 | IRRIGATION | MISS. RIVER ALLUVIAL |
| 199321 | CONCORDIA | CO-47 | 07/13/1998 | CITY OF VIDALIA | 310 | PUBLIC SUPPLY | MISS. RIVER ALLUVIAL |
| 199519 | CONCORDIA | CO-YAKEY | 07/13/1998 | PRIVATE OWNER | 150 | DOMESTIC | MISS. RIVER ALLUVIAL |
| 199207 | CATAHOULA | CT-241 | 07/21/1998 | LA DELTA PLANTATION | 134 | IRRIGATION | MISS. RIVER ALLUVIAL |
| 199601 | CATAHOULA | CT-DENNIS | 09/14/1998 | PRIVATE OWNER | 30 | DOMESTIC | MISS. RIVER ALLUVIAL |
| 199522 | EAST BATON ROUGE | EB-885 | 08/11/1998 | LA STATE UNIVERSITY | 352 | IRRIGATION | MISS. RIVER ALLUVIAL |
| 199603 | EAST CARROLL | EC-370 | 10/12/1998 | HOLLYBROOK LAND | 119 | IRRIGATION | MISS. RIVER ALLUVIAL |
| 198805 | FRANKLIN | FR-368 | 09/14/1998 | CITY OF WINNSBORO | 79 | PUBLIC SUPPLY | MISS. RIVER ALLUVIAL |
| 199803 | IBERVILLE | IB-289 | 08/11/1998 | IBERVILLE WTR. DIST. #2 | 209 | PUBLIC SUPPLY | MISS. RIVER ALLUVIAL |
| 199520 | IBERVILLE | IB-5427Z | 08/10/1998 | PRIVATE OWNER | 160 | DOMESTIC | MISS. RIVER ALLUVIAL |
| 199521 | IBERVILLE | IB-COM | 08/10/1998 | PRIVATE OWNER | 185 | DOMESTIC | MISS. RIVER ALLUVIAL |
| 199322 | MADISON | MA-28 | 09/15/1998 | PEOPLES WATER SERVICE | 128 | PUBLIC SUPPLY | MISS. RIVER ALLUVIAL |
| 199804 | MOREHOUSE | MO-871 | 10/12/1998 | PRIVATE OWNER | 80 | IRRIGATION | MISS. RIVER ALLUVIAL |
| 199604 | OUACHITA | OU-134 | 10/13/1998 | PRIVATE OWNER | 74 | IRRIGATION | MISS. RIVER ALLUVIAL |
| 199401 | RICHLAND | RI-469 | 09/14/1998 | LIDDIEVILLE WATER SYSTEM | 90 | PUBLIC SUPPLY | MISS. RIVER ALLUVIAL |
| 199210 | RICHLAND | RI-48 | 10/13/1998 | RAYVILLE WATER DEPARTMENT | 115 | PUBLIC SUPPLY | MISS. RIVER ALLUVIAL |
| 199204 | ST LANDRY | SL-5477Z | 08/10/1998 | PRIVATE OWNER | 110 | DOMESTIC | MISS. RIVER ALLUVIAL |
| 199524 | ST MARTIN | SMN-33 | 08/10/1998 | LDOTD/LAFAYTTE DISTRICT | 125 | PUBLIC SUPPLY | MISS. RIVER ALLUVIAL |
| 199310 | TENSAS | TS-60 | 09/15/1998 | TOWN OF ST. JOSEPH | 140 | PUBLIC SUPPLY | MISS. RIVER ALLUVIAL |
| 199602 | TENSAS | TS-FORTENB | 09/15/1998 | PRIVATE OWNER | UNKNOWN | DOMESTIC | MISS. RIVER ALLUVIAL |
| 199209 | WEST CARROLL | WC-91 | 10/12/1998 | N.E.W. CARROLL WTR. ASSN. | 110 | PUBLIC SUPPLY | MISS. RIVER ALLUVIAL |
| 199605 | WEST CARROLL | WC-BRAN | 10/12/1998 | PRIVATE OWNER | 80 | IRRIGATION | MISS. RIVER ALLUVIAL |

## Table I-2 Summary of Water Quality Data

**MISSISSIPPI RIVER ALLUVIAL AQUIFER**
**WATER QUALITY PARAMETERS**

**FIELD PARAMETERS**

| *WELL NUMBER* | *TEMP.* $^{O}C$ | *pH* SU | *COND.* mmhos/cm | *SAL.* ppt | *TSS* ppm | *TDS* ppm | *ALK.* ppm | *HARD.* ppm | *TURB.* NTU | *COND.* umhos/cm | *COLOR* PCU | *Cl* ppm | $SO_4$ ppm | *TOT. P* ppm | *TKN* ppm | *TOC* ppm | $NH_3$ (as N) ppm | *NITRITE-NITRATE* (as N) ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AV-5135Z | 20.56 | 6.6 | 0.956 | 0.47 | <4.0 | 756.0 | 334.0 | 416.0 | <1.0 | 1067.0 | <5.0 | 108.0 | 86.30 | 0.13 | 1.20 | 3.90 | 0.26 | 0.08 |
| AV-5135Z* | 20.56 | 6.6 | 0.956 | 0.47 | <4.0 | 756.0 | 334.0 | 415.0 | <1.0 | 1069.0 | <5.0 | 104.0 | 80.20 | 0.14 | 0.32 | 2.30 | 0.32 | 0.08 |
| AV-CHAT | 20.52 | 6.49 | 0.946 | 0.47 | 25.0 | 708.0 | 542.0 | 450.0 | 95.0 | 1022.0 | 20.0 | 39.8 | <1.25 | 1.22 | 1.58 | 5.90 | 1.33 | 0.07 |
| AV-DELTA | 20.55 | 6.66 | 1.575 | 0.79 | 8.0 | 1073.0 | 399.0 | 351.0 | 45.0 | 1612.0 | 20.0 | 113.0 | 296.00 | 0.34 | 0.31 | 3.40 | 0.33 | 0.05 |
| CO-47 | 19.53 | 6.42 | 0.465 | 0.22 | <4.0 | 388.0 | 225.0 | 207.0 | 14.0 | 517.0 | 10.0 | 16.6 | 30.10 | 0.19 | 0.93 | 3.00 | 0.72 | 0.11 |
| CO-YAKEY | 20.87 | 6.43 | 1.091 | 0.52 | 40.0 | 616.0 | 474.0 | 408.0 | 160.0 | 905.0 | 20.0 | 32.7 | <1.25 | 1.31 | 5.44 | 9.70 | 0.33 | 0.29 |
| CT-241 | 20.63 | 6.36 | 0.909 | 0.45 | 22.0 | 578.0 | 473.0 | 399.0 | 110.0 | 1076.0 | 20.0 | 23.2 | <1.25 | 1.08 | 1.52 | 8.80 | 1.27 | 0.05 |
| CT-DENNIS | 20.71 | 5.76 | 0.203 | 0.10 | <4.0 | 178.0 | 81.9 | 70.0 | <1.0 | 211.0 | 10.0 | 34.0 | 9.10 | 0.10 | <0.05 | 2.70 | 0.10 | 0.07 |
| EB-885 | 24.04 | 7.05 | 0.813 | 0.38 | <4.0 | 466.0 | 446.0 | 402.0 | 5.0 | 801.0 | 20.0 | 11.0 | <1.25 | 0.08 | 1.57 | 6.10 | 1.55 | 0.07 |
| EC-370 | 19.28 | 6.24 | 0.738 | 0.36 | 36.0 | 414.0 | 399.0 | 375.0 | 160.0 | 722.0 | 20.0 | 7.6 | <2.00 | 0.99 | 1.10 | 6.10 | 0.84 | <0.02 |
| FR-368 | 19.58 | 6.48 | 1.301 | 0.65 | 12.0 | 726.0 | 306.0 | 366.0 | 70.0 | 1252.0 | 5.0 | 216.0 | 25.60 | 0.37 | 0.51 | 3.40 | 0.50 | <0.02 |
| IB-289 | 20.08 | 6.95 | 0.539 | 0.26 | 12.0 | 304.0 | 262.0 | 244.0 | 19.0 | 542.0 | 30.0 | 20.8 | 5.30 | 0.02 | 1.60 | 7.60 | 1.58 | <0.02 |
| IB-5427Z | 22.14 | 7.29 | 0.37 | 0.18 | <4.0 | 212.0 | 151.0 | 136.0 | 4.4 | 381.0 | 20.0 | 24.3 | 10.60 | 0.27 | 1.13 | 3.50 | 1.10 | 0.02 |
| IB-COM | 23.18 | 6.99 | 1.374 | 0.69 | 10.0 | 752.0 | 331.0 | 372.0 | 35.0 | 1394.0 | 20.0 | 245.0 | <1.25 | 0.09 | 0.39 | 3.60 | 0.47 | <0.02 |
| MA-28 | 19.80 | 6.75 | 0.98 | 0.49 | 34.5 | 554.0 | 479.0 | 380.0 | 165.0 | 911.0 | 10.0 | 30.1 | <2.00 | 1.10 | 1.77 | 8.60 | 1.34 | <0.02 |
| MO-871 | 19.10 | 6.6 | 0.477 | 0.23 | 6.0 | 296.0 | 216.0 | 196.0 | 8.9 | 492.0 | 20.0 | 17.2 | 22.10 | 0.30 | 0.26 | 2.90 | 0.26 | <0.02 |
| OU-134 | 18.94 | 6.75 | 0.675 | 0.33 | 30.0 | 410.0 | 335.0 | 267.0 | 85.0 | 707.0 | 20.0 | 31.7 | 4.90 | 1.02 | 1.34 | 2.20 | 0.91 | <0.02 |
| RI-469 | 20.10 | 6.13 | 0.23 | 0.11 | <4.0 | 178.0 | 57.7 | 69.8 | <1.0 | 232.0 | 5.0 | 27.4 | 2.70 | 0.12 | 0.55 | <2.00 | 0.40 | 3.08 |
| RI-469* | 20.10 | 6.13 | 0.23 | 0.11 | <4.0 | 175.0 | 57.7 | 69.5 | <1.0 | 230.0 | 5.0 | 27.2 | 2.80 | 0.11 | 0.27 | <2.00 | 0.30 | 2.98 |
| RI-48 | 19.77 | 7.28 | 0.599 | 0.29 | <4.0 | 362.0 | 251.0 | 262.0 | 1.3 | 642.0 | <5.0 | 41.2 | 29.30 | 0.09 | 2.33 | <2.00 | 0.37 | 0.02 |
| SL-5477Z | 21.83 | 6.39 | 0.842 | 0.41 | 60.0 | 470.0 | 422.0 | 366.0 | 250.0 | 805.0 | 30.0 | 21.1 | <1.25 | 1.89 | 7.17 | 7.50 | 6.53 | <0.02 |
| SMN-33 | 20.83 | 6.94 | 0.502 | 0.24 | 5.0 | 296.0 | 247.0 | 212.0 | 13.0 | 516.0 | 30.0 | <1.25 | <1.25 | 0.24 | 1.00 | 3.20 | 1.20 | <0.02 |
| SMN-33* | 20.83 | 6.94 | 0.502 | 0.24 | 4.5 | 300.0 | 246.0 | 211.0 | 14.0 | 512.0 | 30.0 | 21.7 | <1.25 | 0.24 | 1.06 | 5.00 | 1.04 | <0.02 |
| TS-60 | 19.88 | 6.66 | 0.912 | 0.45 | 24.0 | 532.0 | 447.0 | 380.0 | 120.0 | 866.0 | 20.0 | 31.6 | <2.00 | 0.66 | 1.16 | 5.30 | 1.24 | <0.02 |
| TS-FORTENB | 21.87 | 6.81 | 0.849 | 0.42 | 31.0 | 498.0 | 439.0 | 374.0 | 140.0 | 810.0 | 10.0 | 15.2 | <2.00 | 1.37 | 1.25 | 8.80 | 0.91 | 0.17 |

## Table I-2 (Cont'd)

| *WELL NUMBER* | *TEMP.* $^{O}C$ | *pH* SU | *COND.* mmhos/cm | *SAL.* ppt | *TSS* ppm | *TDS* ppm | *ALK.* ppm | *HARD.* ppm | *TURB.* NTU | *COND.* umhos/cm | *COLOR* PCU | *Cl* ppm | *$SO_4$* ppm | *TOT. P* ppm | *TKN* ppm | *TOC* ppm | *$NH_3$* (as N) ppm | *NITRITE-NITRATE* (as N) ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WC-91 | 19.23 | 7.06 | 1.022 | 0.51 | 4.0 | 580.0 | 316.0 | 410.0 | 5.5 | 1067.0 | 5.0 | 152.0 | 12.00 | 0.13 | 0.33 | 2.40 | 0.31 | 0.05 |
| WC-91* | 19.23 | 7.06 | 1.022 | 0.51 | 2.0 | 578.0 | 311.0 | 409.0 | 5.5 | 1071.0 | 5.0 | 153.0 | 12.10 | 0.10 | 0.76 | <2.00 | 0.17 | 0.05 |
| WC-BRAN | 19.28 | 6.58 | 1.287 | 0.65 | 8.0 | 762.0 | 487.0 | 550.0 | 50.0 | 1326.0 | 10.0 | 135.0 | 45.30 | 0.18 | 0.84 | 2.90 | 0.51 | 0.02 |

* Denotes duplicate sample.

# Table I-3 Summary of Inorganic Data

## MISSISSIPPI RIVER ALLUVIAL AQUIFER
## INORGANIC (TOTAL METALS) PARAMETERS

| *WELL NUMBER* | *ARSENIC* ppb | *SILVER* ppb | *BARIUM* ppb | *BERYLLIUM* ppb | *CADMIUM* ppb ** | *CHROMIUM* ppb | *COPPER* ppb | *IRON* ppb | *MERCURY* ppb | *NICKEL* ppb | *ANTIMONY* ppb | *SELENIUM* ppb | *LEAD* ppb ** | *THALLIUM* ppb | *ZINC* ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AV-5135Z | 5.3 | <1.0 | 190.0 | <1.0 | 7.2 | <5.0 | 5.4 | 95.9 | 0.06 | <5.0 | <5.0 | <5.0 | 17.4 | <5.0 | <10.0 |
| AV-5135Z* | <5.0 | 1.2 | 190.0 | <1.0 | 6.4 | <5.0 | <5.0 | 144.0 | 0.07 | <5.0 | <5.0 | <5.0 | 16.0 | <5.0 | <10.0 |
| AV-CHAT | 29.9 | <1.0 | 1091.0 | <1.0 | 5.0 | <5.0 | 5.8 | 1,355.0 | 0.06 | 6.0 | <5.0 | <5.0 | 18.7 | <5.0 | 29.3 |
| AV-DELTA | <5.0 | 1.0 | 57.1 | <1.0 | 7.3 | <5.0 | <5.0 | 4,783.0 | 0.06 | <5.0 | <5.0 | <5.0 | 18.4 | <5.0 | 17.6 |
| CO-47 | 56.5 | <1.0 | 352.0 | <1.0 | 3.9 | <5.0 | <5.0 | 1,051.0 | 0.05 | 5.1 | <5.0 | <5.0 | 12.7 | <5.0 | 160.0 |
| CO-YAKEY | 50.0 | <1.0 | 875.0 | <1.0 | 5.1 | <5.0 | 56.0 | 5,325.0 | 0.06 | 5.8 | <5.0 | <5.0 | 24.9 | <5.0 | 165.9 |
| CT-241 | <5.0 | <1.0 | 422.0 | <1.0 | 11.0 | <5.0 | 6.1 | 8,651.0 | 0.05 | <5.0 | <5.0 | <5.0 | 22.4 | <5.0 | 20.2 |
| CT-DENNIS | <5.0 | <1.0 | 72.7 | <1.0 | 2.3 | <5.0 | <5.0 | 20.7 | <0.05 | <5.0 | <5.0 | <5.0 | <10.0 | <5.0 | 100.0 |
| EB-885 | 29.9 | <1.0 | 798.0 | <1.0 | 5.0 | <5.0 | 5.8 | 1,355.0 | <0.05 | 6.1 | <5.0 | <5.0 | 18.7 | <5.0 | 293.0 |
| EC-370 | <5.0 | <1.0 | 671.0 | <1.0 | 1.1 | <5.0 | <5.0 | 14,338.0 | <0.05 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <10.0 |
| FR-368 | <5.0 | <1.0 | 202.0 | <1.0 | 11.0 | <5.0 | 11.6 | 104.5 | <0.05 | <5.0 | <5.0 | <5.0 | 39.7 | <5.0 | 170.1 |
| IB-289 | 50.0 | <1.0 | 688.0 | <1.0 | 5.1 | 1.6 | 56.0 | 4,770.0 | <0.05 | 5.8 | <5.0 | <5.0 | 24.9 | <5.0 | 166.0 |
| IB-5427Z | 56.5 | <1.0 | 275.0 | <1.0 | 3.9 | <5.0 | <5.0 | 1,051.0 | <0.05 | 5.1 | <5.0 | <5.0 | 12.7 | <5.0 | 160.4 |
| IB-COM | 7.7 | <1.0 | 1017.0 | <1.0 | 4.4 | <5.0 | <5.0 | 3,608.0 | <0.05 | 5.0 | <5.0 | <5.0 | 18.2 | <5.0 | 110.2 |
| MA-28 | <5.0 | <1.0 | 574.0 | <1.0 | 3.5 | <5.0 | <5.0 | 17,556.0 | <0.05 | <5.0 | <5.0 | <5.0 | <10.0 | <5.0 | 23.6 |
| MO-871 | <5.0 | <1.0 | 225.0 | <1.0 | <1.0 | <5.0 | <5.0 | 2,115.0 | <0.05 | <5.0 | <5.0 | <5.0 | <10.0 | <5.0 | 41.4 |
| OU-134 | <5.0 | <1.0 | 94.6 | <1.0 | <1.0 | <5.0 | <5.0 | 4,510.0 | <0.05 | <5.0 | <5.0 | <5.0 | <10.0 | <5.0 | 42.5 |
| RI-469 | <5.0 | <1.0 | 32.5 | <1.0 | 11.2 | 5.6 | 5.0 | 7.6 | <0.05 | <5.0 | <5.0 | <5.0 | 38.8 | <5.0 | 199.0 |
| RI-469* | <5.0 | <1.0 | 895.0 | <1.0 | 12.6 | 8.5 | 7.8 | 65.3 | <0.05 | 5.2 | <5.0 | <5.0 | 45.5 | <5.0 | 175.0 |
| RI-48 | <5.0 | <1.0 | 420.0 | <1.0 | <1.0 | <5.0 | <5.0 | 188.0 | <0.05 | <5.0 | <5.0 | <5.0 | <10.0 | <5.0 | <10.0 |
| SL-5477Z | 81.8 | <1.0 | 811.0 | <1.0 | 11.6 | <1.0 | <5.0 | 21,339.0 | <0.05 | 8.0 | <5.0 | <5.0 | 29.1 | <5.0 | 45.4 |
| SMN-33 | <5.0 | <1.0 | 694.0 | <1.0 | 4.3 | <5.0 | <5.0 | 2,049.0 | <0.05 | <5.0 | <5.0 | <5.0 | 12.5 | <5.0 | 28.4 |
| SMN-33* | <5.0 | <1.0 | 654.0 | <1.0 | 4.2 | <5.0 | <5.0 | 1,270.0 | <0.05 | 6.2 | <5.0 | <5.0 | 11.1 | <5.0 | 37.6 |
| TS-60 | 5.8 | <1.0 | 695.0 | <1.0 | 13.6 | <5.0 | 6.6 | 9,816.0 | <0.05 | <5.0 | <5.0 | <5.0 | 37.4 | <5.0 | 49.5 |
| TS-FORTENB | 21.5 | <1.0 | 40.0 | <1.0 | 15.2 | <5.0 | 23.0 | 11,017.0 | <0.05 | 5.0 | <5.0 | <5.0 | 43.7 | <5.0 | 1126.0 |

## Table I-3 (Cont'd)

| *WELL NUMBER* | *ARSENIC* ppb | *SILVER* ppb | *BARIUM* ppb | *BERYLLIUM* ppb | *CADMIUM* ppb | *CHROMIUM* ppb | *COPPER* ppb | *IRON* ppb | *MERCURY* ppb | *NICKEL* ppb | *ANTIMONY* ppb | *SELENIUM* ppb | *LEAD* Ppb | *THALLIUM* ppb | *ZINC* ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WC-91 | <5.0 | <1.0 | 166.0 | <1.0 | 1.0 | <5.0 | <5.0 | 3,591.0 | <0.05 | <5.0 | <5.0 | <5.0 | <10.0 | <5.0 | <10.0 |
| WC-91* | <5.0 | <1.0 | 162.0 | <1.0 | <1.0 | <5.0 | <5.0 | 769.0 | <0.05 | <5.0 | <5.0 | <5.0 | <10.0 | <5.0 | 29.4 |
| WC-BRAN | <5.0 | <1.0 | 392.0 | <1.0 | <1.0 | <5.0 | <5.0 | 2,143.0 | <0.05 | <5.0 | <5.0 | <5.0 | <10.0 | <5.0 | <10.0 |

* Denotes duplicate sample.

** For an explanation of the shaded Cadmium and Lead values refer to Quantifiable Cadmium and Lead Values on page 4.

**Table I-4 List of VOC Analytical Parameters**
BASELINE MONITORING PROJECT

VOLATILE ORGANICS BY EPA METHOD 8260

| COMPOUNDS | PQL (ppb) |
|---|---|
| DICHLOROFLUOROMETHANE | 5 |
| CHLOROMETHANE | 5 |
| VINYL CHLORIDE | 5 |
| BROMOMETHANE | 5 |
| CHLOROETHANE | 5 |
| TRICHLOROFLUOROMETHANE | 5 |
| 1,1-DICHLOROETHENE | 5 |
| METHYLENE CHLORIDE | 5 |
| TRANS-1,2-DICHLOROETHENE | 5 |
| 1,1-DICHLOROETHANE | 5 |
| 2,2 DICHLOROPROPANE | 5 |
| CIS-1,2 DICHLOROETHENE | 5 |
| BROMOCHLOROMETHANE | 5 |
| CHLOROFORM | 5 |
| 1,1,1-TRICHLOROETHANE | 5 |
| 1,1 DICHLOROPROPENE | 5 |
| CARBON TETRACHLORIDE | 5 |
| BENZENE | 5 |
| 1,2-DICHLOROETHANE | 5 |
| TRICHLOROETHENE | 5 |
| 1,2-DICHLOROPROPANE | 5 |
| BROMODICHLOROMETHANE | 5 |
| DIBROMOMETHANE | 5 |
| CIS-1,3-DICHLOROPROPENE | 5 |
| TOLUENE | 5 |
| TRANS-1,3-DICHLOROPROPENE | 5 |
| 1,1,2-TRICHLOROETHANE | 5 |
| 1,3--DICHLOROPROPANE | 5 |
| TETRACHLOROETHENE | 5 |
| 1,2-DIBROMOETHANE | 5 |
| DIBROMOCHLOROMETHANE | 5 |
| CHLOROBENZENE | 5 |
| ETHYLBENZENE | 5 |
| 1,1,1,2-TETRACHLOROETHANE | 5 |
| P&M XYLENE | 10 |
| O-XYLENE | 5 |
| STYRENE | 5 |
| BROMOFORM | 5 |
| ISOPROPYLBENZENE | 5 |

**Table I-4 (Cont'd)**
Volatile Organic (VOC) Parameters

| COMPOUNDS | PQL (ppb) |
|---|---|
| 1,1,2,2-TETRACHLOROMETHANE | 5 |
| 1,2,3,-TRICHLOROPROPANE | 5 |
| BROMOBENZENE | 5 |
| n-PROPYLBENZENE | 5 |
| 2-CHLOROTOLUENE | 5 |
| 4-CHLOROTOLUENE | 5 |
| 1,3,5-TRIMETHYLBENZENE | 5 |
| TERT-BUTYLBENZENE | 5 |
| 1,2,4-TRIMETHYLBENZENE | 5 |
| SEC-BUTYLBENZENE | 5 |
| P-ISOPROPYLTOLUENE | 5 |
| 1,3-DICHLOROBENZENE | 5 |
| 1,4-DICHLOROBENZENE | 5 |
| n-BUTYLBENZENE | 5 |
| 1,2-DIBROMO-3-CHLOROPROPANE | 5 |
| NAPHTHALENE | 5 |
| 1,2,4-TRICHLOROBENZENE | 5 |
| HEXACHLOROBUTADIENE | 5 |
| 1,2-DICHLOROBENZENE | 5 |
| 1,2,3-TRICHLOROBENZENE | 5 |

PQL = Practical Quantitation Limit
ppb = parts per billion

**Table I-5 List of Semi-volatile Analytical Parameters**
BASELINE MONITORING PROJECT

SEMIVOLATILE ORGANICS BY EPA METHOD 8270

| COMPOUNDS | PQL (ppb) |
|---|---|
| N-Nitrosodimethylamine | 10 |
| 2-Picoline | 10 |
| Methyl methanasulfonate | 10 |
| Ethyl methanesulfonate | 20 |
| Phenol | 10 |
| Aniline | 10 |
| Bis(2-chloroethyl)ether | 10 |
| 2-Chlorophenol | 10 |
| 1,3-Dichlorobenzene | 10 |
| 1,4-Dichlorobenzene | 10 |
| Benzyl alcohol | 10 |
| 1,2-Dichlorobenzene | 10 |
| 2-Methylphenol | 10 |
| Bis(2-chloroisopropyl)ether | 10 |
| 4-Methylphenol | 10 |
| N-Nitroso-di-n-propylamine | 10 |
| Hexachloroethane | 20 |
| Acetophenone | 10 |
| Nitrobenzene | 10 |
| N-Nitrosopiperidine | 20 |
| Isophorone | 10 |
| 2,4-Dimethylphenol | 10 |
| 2-Nitrophenol | 10 |
| Benzoic acid | 50 |
| Bis(2-chloroethoxy)methane | 10 |
| 2,4-Dichlorophenol | 10 |
| a,a-Dimethylphenethylamine | 10 |
| 1,2,4-trichlorobenzene | 10 |
| Benzidine | 50 |
| Pyrene | 10 |
| p-Dimethylaminoazobenzene | 10 |
| Butylbenzylphthalate | 10 |
| Bis(2-ethylhexyl)phthalate | 10 |

**Table I-5 (Cont'd)**
Semivolatile Parameters

| COMPOUNDS | PQL (ppb) |
|---|---|
| 3,3'-Dichlorobenzidine | 20 |
| Benzo(a)anthracene | 10 |
| Chrysene | 10 |
| Di-n-octylphthalate | 10 |
| 7,12-Dimetnylbenz(a)anthracine | 10 |
| Benzo(b)fluoranthene | 10 |
| Benzo(k)fluoranthene | 10 |
| Benzo(a)pyrene | 10 |
| 3-Methylcholanthrene | 10 |
| Dibenz(a,j)acridine | 10 |
| Indeno(1,2,3-cd)pyrene | 10 |
| Dibenz(a,h)anthracene | 10 |
| Benzo(g,h,i)perylene | 10 |
| Napthalene | 10 |
| 4-Chloroaniline | 10 |
| 2,6-Dichlorophenol | 10 |
| Hexachlorobutadiene | 10 |
| N-Nitrose-di-n-butylamine | 10 |
| 4-Chloro-3-methylphenol | 20 |
| 2-Methylnapthalene | 10 |
| Hexachlorocyclopentadiene | 10 |
| 1,2,4,5-Tetrachlorobenzene | 10 |
| 2,4,6-Trichlorophenol | 10 |
| 2,4,5-Trichlorophenol | 10 |
| 2-Chloronapthalene | 10 |
| 1-Chloronapthalene | 10 |
| 2-Nitroaniline | 50 |
| Dimethylphthalate | 10 |
| 2,6-Dinitrotoluene | 10 |
| Acenaphthylene | 10 |
| 3-Nitroaniline | 50 |
| 4-Nitrophenol | 50 |
| 2,4-Dinitrophenol | 50 |
| Acenaphthene | 10 |

**Table I-5 (Cont'd)**
Semivolatile Parameters

| COMPOUNDS | PQL (ppb) |
|---|---|
| 2,4-Dinitrotoluene | 10 |
| Pentachlorobenzene | 10 |
| Dibenzofuran | 10 |
| 1-Naphthylamine | 10 |
| Diethylphthalate | 10 |
| 2,3,4,6-Tetrachlorophenol | 10 |
| 2-Naphthylamine | 10 |
| 4-Chlorophenyl phenyl ether | 10 |
| 4-Nitroaniline | 50 |
| Fluorene | 10 |
| 4,6-Dinitro-2-methylphenol | 50 |
| 4-Aminobiphenyl | 20 |
| 1,2-Diphenylhydrazine | 10 |
| Phenacetin | 20 |
| 4-Bromophenyl phenyl ether | 10 |
| Hexachlorobenzene | 10 |
| Pronamide | 10 |
| N-Nitrosodiphenylamine/Diphenylamine | 10 |
| Pentachlorophenol | 50 |
| Pentachloronitrobenzene | 20 |
| Phenathrene | 10 |
| Anthracene | 10 |
| Di-n-butylphthalate | 10 |
| Fluoranthene | 10 |

**Table I-6 List of Pesticide and PCB Analytical Parameters**
BASELINE MONITORING PROJECT

SEMIVOLATILE ORGANICS BY EPA METHOD 8270

| COMPOUNDS | PQL (ppb) |
|---|---|
| Alpha BHC | 2 |
| Beta BHC | 2 |
| Gamma BHC | 2 |
| Delta BHC | 2 |
| Heptachlor | 2 |
| Aldrin | 2 |
| Heptachlor epoxide | 2 |
| Chlordane | 2 |
| Endosulfan I | 2 |
| 4,4'-DDE | 2 |
| Dieldrin | 2 |
| 4,4'DDD | 2 |
| Endrin | 2 |
| Toxaphene | 75, 2* |
| Endosulfan II | 2 |
| Endrin Aldehyde | 2 |
| 4,4'DDT | 2 |
| Endosulfan Sulfate | 2 |

* The first toxaphene PQL denotes the PQL for the July-September sampling events, while the second PQL denotes the PQL for the October sampling event.

SEMIVOLATILE ORGANICS BY EPA METHOD 8270

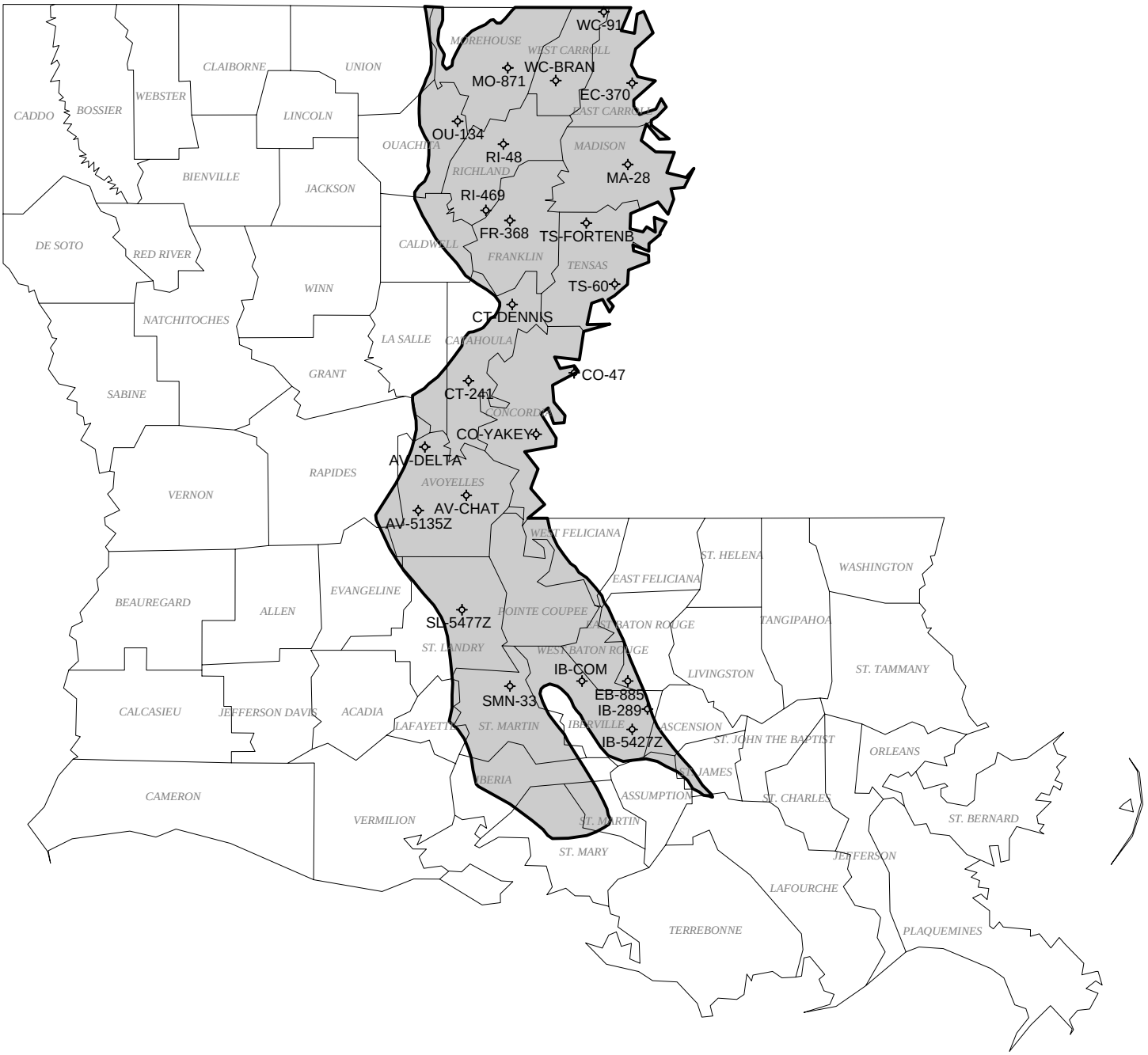
| COMPOUNDS | PQL (ppb) |
|---|---|
| PCB 1221/ PCB 1232 | 10 |
| PCB 1016/ PCB 1242 | 10 |
| PCB 1254 | 10 |
| PCB 1248 | 10 |
| PCB 1260 | 10 |

## Table I-7 Summary of Resample Data

**MISSISSIPPI RIVER ALLUVIAL AQUIFER**
**INORGANIC (TOTAL METALS) PARAMETERS RESAMPLED**

| *WELL NUMBER* | *ARSENIC* ppb | *SILVER* ppb | *BARIUM* ppb | *BERYLLIUM* ppb | *CADMIUM* ppb | *CHROMIUM* ppb | *COPPER* ppb | *IRON* ppb | *MERCURY* ppb | *NICKEL* ppb | *ANTIMONY* ppb | *SELENIUM* ppb | *LEAD* ppb | *THALLIUM* ppb | *ZINC* ppb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO-47 | <1.0 | <5.0 | 402 | <1.0 | <1.0 | <1.0 | 5.3 | 2,596 | <0.05 | <5.0 | <5.0 | <5.0 | <10.0 | <5.0 | <10.0 |
| FR-368 | <5.0 | <1.0 | 210.5 | <1.0 | <1.0 | <5.0 | <5.0 | 5,687 | <0.05 | <5.0 | <5.0 | <5.0 | <10.0 | <5.0 | 13.0 |
| RI-469 | <5.0 | <1.0 | 33.3 | <1.0 | <1.0 | <5.0 | 5.8 | 25.3 | <0.05 | <5.0 | <5.0 | <5.0 | <10.0 | <5.0 | 1,758 |
| RI-843 | <5.0 | <1.0 | 32.7 | <1.0 | <1.0 | <5.0 | 6.3 | 74.5 | <0.05 | <5.0 | <5.0 | <5.0 | <10.0 | <5.0 | 40.7 |

# BASELINE MONITORING PROJECT WELLS OF THE MISSISSIPPI RIVER ALLUVIAL AQUIFER




Aquifer bondary digitized from Louisiana Hydrologic Map No. 2: Areal extent of Freshwater in Major Aquifers of Louisiana. Smoot, 1988; USGS/LDOTD Report 86-4150

**Figure I-1 Location Plat, Mississippi River Alluvial Aquifer**

# MISSISSIPPI RIVER ALLUVIAL AQUIFER - pH (SU)

Baseline Monitoring Project, FY98-99

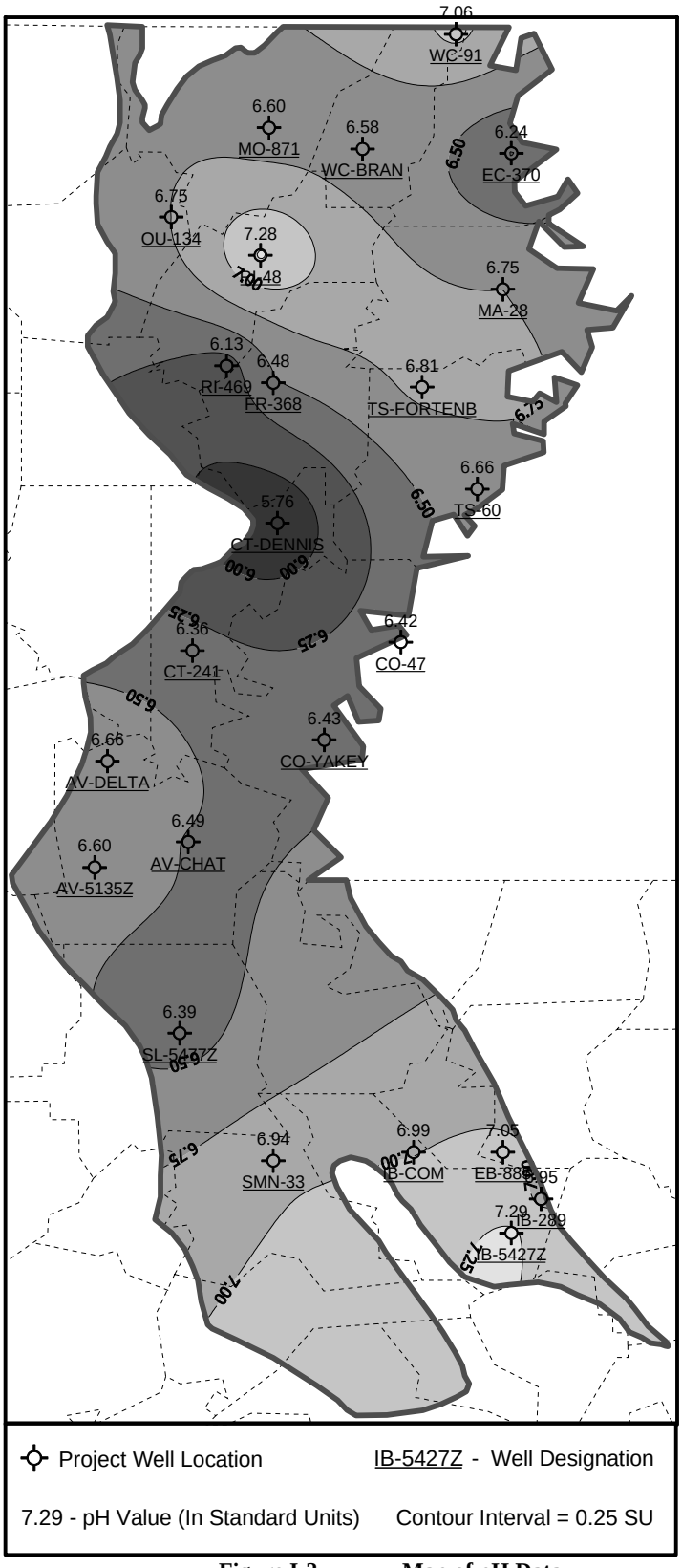



**Figure I-2 Map of pH Data**

# MISSISSIPPI RIVER ALLUVIAL AQUIFER - TDS (ppm)

Baseline Monitoring Project, FY98-99

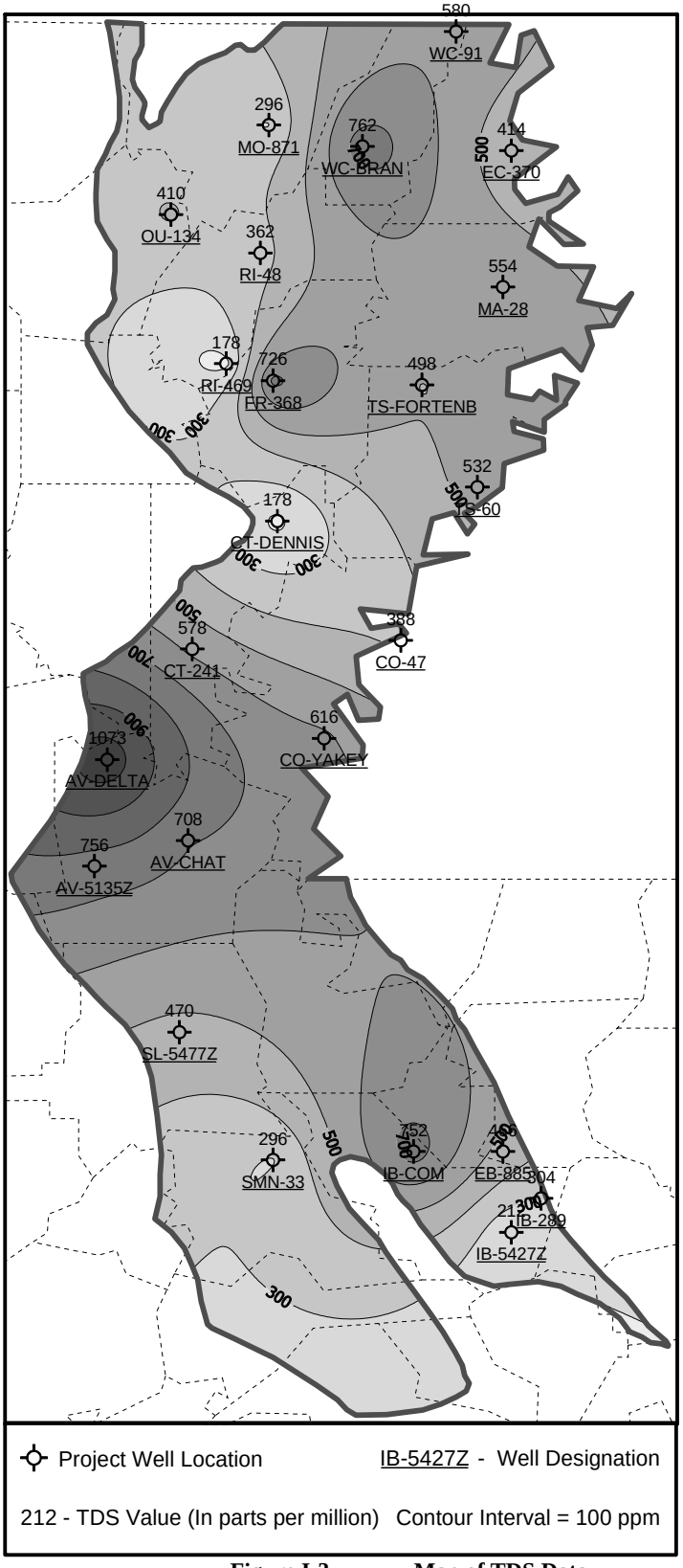



**Figure I-3 Map of TDS Data**

# MISSISSIPPI RIVER ALLUVIAL AQUIFER - CHLORIDE (ppm)

Baseline Monitoring Project, FY98-99

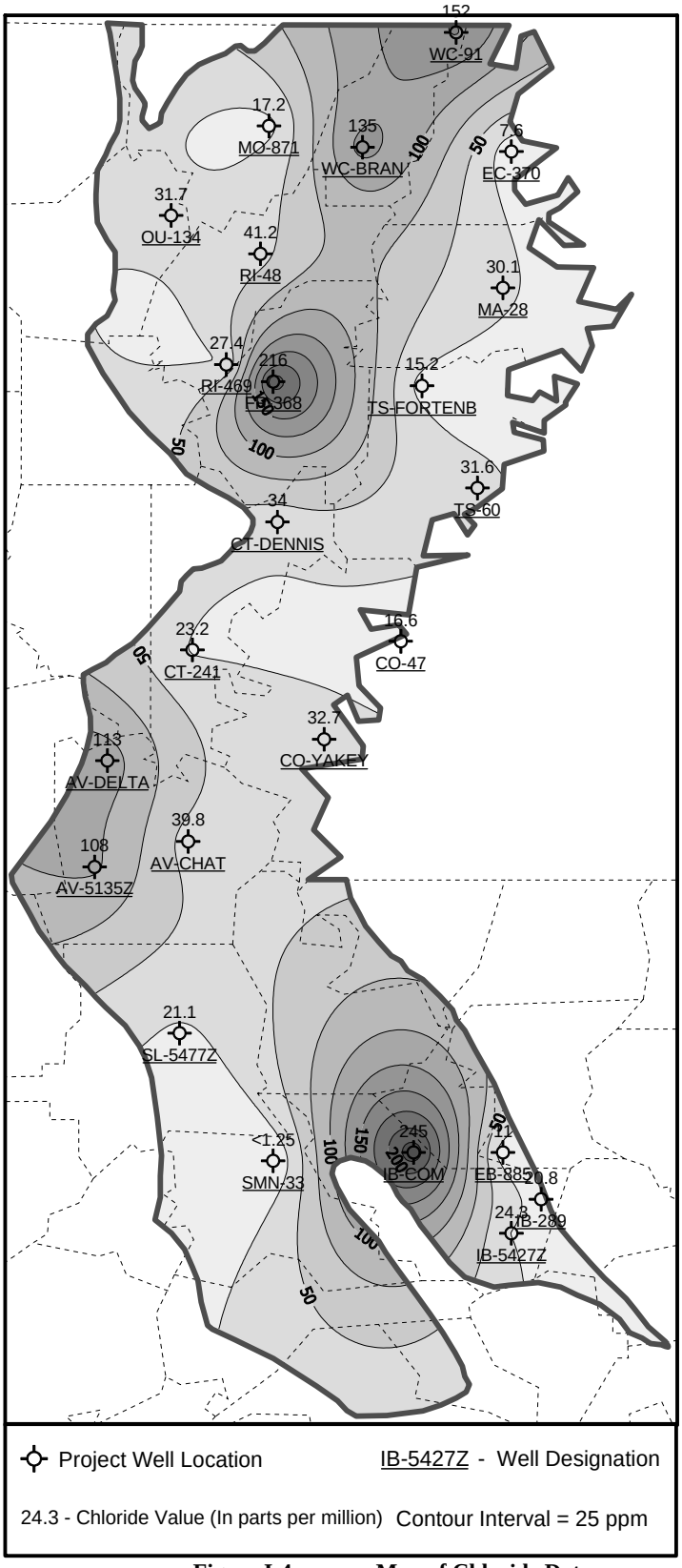



**Figure I-4 Map of Chloride Data**

# MISSISSIPPI RIVER ALLUVIAL AQUIFER - IRON (ppb)

Baseline Monitoring Project, FY98-99

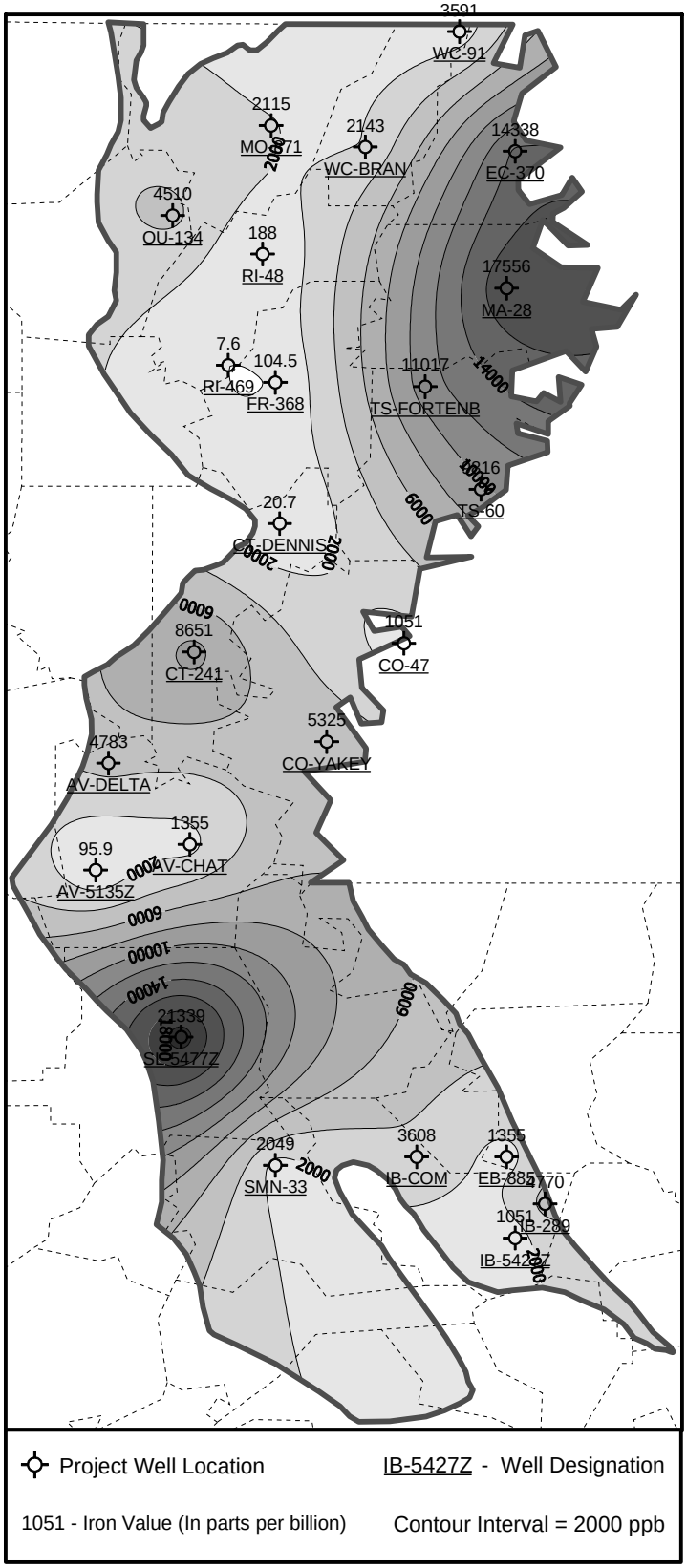



**Figure I-5 Map of Iron Data**