JASPER EQUIVALENT AQUIFER SYSTEM SUMMARY

BASELINE MONITORING PROJECT, FY 2003

APPENDIX 14

OF THE

TRIENNIAL SUMMARY REPORT, 2003

FOR THE

ENVIRONMENTAL EVALUATION DIVISION

OF

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PARTIAL FUNDING PROVIDED THROUGH 106 CWA

JASPER EQUIVALENT AQUIFER SYSTEM SUMMARY
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BACKGROUND

In order to 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 Baseline Monitoring Project (Project or BMP) wells producing from a common aquifer in a narrow time frame. Also, to more conveniently and economically promulgate those data collected from a particular aquifer, a summary report on each aquifer sampled was prepared separately. Collectively, these aquifer summaries will make up part of the Project Triennial Summary Report.

In March, April, and May of 2003, fifteen wells that produce from the Jasper Equivalent aquifer system were sampled for water quality parameters, metals, nutrients, volatile organic compounds, semi-volatile organic compounds, pesticides, and PCBs. These wells are located in nine parishes in southeast Louisiana.

Figure 14-1 shows the geographic locations of the Jasper Equivalent Aquifer System and the associated project wells, whereas Table 14-2 lists the wells in the aquifer along with their total depths and the use made of produced waters and the date sampled.

Well data for registered project water wells were obtained from the Louisiana Department of Transportation and Development's Water Well Registration Data file.

GEOLOGY

The Jasper Equivalent aquifer system is composed of the Miocene aged aquifers of the Baton Rouge area and St. Tammany, Tangipahoa, and Washington Parishes. These Miocene sediments outcrop in southwestern Mississippi. The sedimentary sequences that make up the aquifer system are subdivided into several aquifer units separated by confining beds. Northward within southeast Louisiana, fewer units are recognized because some younger units pinch out updip and some clay layers present to the south disappear. Where clay layers are discontinuous or disappear, aquifer units coalesce. The aquifers consist of fine to coarse sand and gravel, with grain size increasing and sorting decreasing with depth.

HYDROGEOLOGY

The deposits that constitute the individual aquifers are not readily differentiated at the surface and act as one hydraulic system that can be subdivided into several hydrologic zones in the subsurface. A zone or ridge of saline water occurs within the Miocene sediments beneath the Mississippi River alluvial valley. Recharge occurs primarily by the direct infiltration of rainfall in interstream, upland outcrop areas, and by the movement of water between aquifers. The hydraulic conductivity varies between 10-200 feet/day.

The maximum depths of occurrence of freshwater in the Jasper Equivalent range from 500 to 3,200 feet below sea level. The range of thickness of the fresh water interval in the Jasper Equivalent is 1,600 to 2,350 feet. The depths of the Jasper Equivalent wells that were monitored in conjunction with the BMP range from 960 to 2,700 feet.

INTERPRETATION OF DATA

Field, Water Quality, and Nutrients Parameters

Table 14-3 lists the field parameters that are checked and the water quality and nutrients parameters that are sampled for at each well. It also shows the field results and the water quality and nutrients analytical results for each well. Table 14-5 lists the minimum, maximum, and average results for the field data, water quality data, and nutrients data for the Jasper Equivalent Aquifer System.

Federal Primary Drinking Water Standards

Under the Federal Safe Drinking Water Act, EPA has established maximum contaminant levels (MCLs) 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.

A review of the analyses listed on Table 14-3 shows that no primary MCL was exceeded for field, water quality, or nutrients parameters. Those project wells reporting turbidity levels greater than 1.0 NTU, do not exceed the Primary MCL of 1.0, as this standard applies only to public supply surface water systems and ground water systems under the influence of surface water.

Federal Secondary Drinking Water Standards

EPA has set secondary standards that are defined as non-enforceable taste, odor, or appearance guidelines.

Field and laboratory data contained in Table 14-3 show that the following secondary MCLs (SMCL)s were exceeded.

Color – SMCL = 15 PCU

PC-275 (original and duplicate samples) – 28 PCU
WA-248 – 22 PCU
ST-763 – 16 PCU

pH – SMCL = 6.5 – 8.5 S.U.

EB-630 (original and duplicate samples) – 8.96 S.U.
EF-272 – 8.89 S.U.
PC-275 (original and duplicate samples) – 9.06 S.U.
SH-104 (original and duplicate samples) – 8.60 S.U.
EB-770 – 8.68 S.U.
WF-264 – 8.66 S.U.
LI-185 – 8.71 S.U.
WA-248 – 8.51 S.U.

Comparison to Historical Data

Table 14-7 lists the current field, water quality, and nutrients data averages alongside those parameters' data averages for the two previous sampling rotations (three and six years prior). A comparison shows that the averages for pH, sulfate, Alkalinity, and Hardness have increased with minor fluctuations of Chloride and Color. The data also show that Nitrite/Nitrate increased to just above the detection limit. Most other analyte values have been consistent with only slight fluctuations.

Inorganic Parameters

Table 14-4 shows the inorganic (total metals) parameters that are sampled for and the analytical results for those parameters for each well. Table 14-6 lists the minimum, maximum, and average results for the inorganic data for the Jasper Equivalent Aquifer System.

Federal Primary Drinking Water Standards

Further review of the analyses listed on Table 14-4 shows that no primary MCL was exceeded for inorganic parameters.

Federal Secondary Drinking Water Standards

Laboratory data contained in Table 14-4 show that the following secondary SMCL was exceeded.

Iron – SMCL = 300 ppb

EB-770 – 659 ppb LI-229 – 666 ppb

Comparison to Historical Data

Table 14-8 lists the current inorganic data averages alongside the inorganic data averages for the two previous sampling rotations (three and six years prior). A comparison shows that iron and zinc increased while the other averages have been consistent, with only slight fluctuations.

Volatile Organic Compounds

Table 14-9 shows the volatile organic compound (VOC) parameters that are sampled for. Due to the large number of analytes in this category, a total list of the analytical results for each analyte is not provided, however any detection of a VOC would be discussed in this section.

No VOCs analyzed exceeded any MCLs for this category of analytes. The VOCs that were detected at or above their respective detection limits during the FY 2003 sampling of the Jasper Equivalent Aquifer System are those typically resulting from disinfection by-products. Dibromochloromethane, Bromodichloromethane, and Chloroform were reported at 1.9, 3, and 5.5 ppb respectively from public supply well EB-770. The detection of these compouds are believed to be from the disinfection process and not due to aquifer contamination.

Semivolatile Organic Compounds

Table 14-10 shows the semivolatile organic compound (SVOC) parameters that are sampled for. Due to the large number of analytes in this category, a total list of the analytical results for each analyte is not provided, however any detection of a semivolatile would be discussed in this section.

No SVOC was detected at or above their respective detection limits during the 2003 sampling of the Jasper Equivalent Aquifer System.

Pesticides and PCBs

Table 14-11 shows the pesticide and PCB parameters that are sampled for. Due to the large number of analytes in this category, a total list of the analytical results for each analyte is not provided, however any detection of a pesticide or PCB would be discussed in this section.

No pesticide or PCB was detected during the 2003 sampling of the Jasper Equivalent Aquifer System.

Common Water Characteristics

Table 14-1 highlights some of the more common water characteristics that are considered when studying ground water quality. The minimum, maximum, and average values that were found during the current sampling of the Jasper Equivalent Aquifer System for Chloride, Field pH, Hardness, Iron, and Nitrite/Nitrate (as N) are listed in the table. Figures 14-2, 14-3, 14-4, and 14-5 respectively, represent the contoured data for pH, TDS, chloride, and iron. The data values that are contoured and reported in the following maps are derived from the current sampling of each well. Averaged data values are used when duplicate samples were collected. The data average for hardness show that the ground water produced from this aquifer is soft[1]

SUMMARY AND RECOMMENDATIONS

In summary, the data show that the ground water produced from the Jasper Equivalent Aquifer System is soft and that no primary MCLs were exceeded. Furthermore, this aquifer is of good quality when considering taste, odor, or appearance guidelines. A comparison of present and historical BMP data averages also shows that for the most part the data averages are fairly consistent, with small increases in alkalinity, hardness, iron, sulfate, and zinc.

It is recommended that the Project wells assigned to the Jasper Equivalent Aquifer System be resampled as planned in approximately three years. In addition, several wells should be added to those currently in place to increase the well density for this aquifer.

[1] Classification based on hardness scale from: *Peavey, H. S. et all. Environmental Engineering, 1985.*

Table 14-1 Common Water Characteristics

PARAMETER	MINIMUM	MAXIMUM	AVERAGE
Chloride (ppm)	2.3	113.0	12.6
Field pH (SU)	8.14	9.19	8.67
Hardness (ppm)	5.0	8.9	5.7
Iron (ppb)	20.0	666.0	99.7
Nitrate and Nitrite (ppm)	0.05	0.29	0.06
TDS (ppm)	134	454	229

Table 14-2 List of Project Wells Sampled

BMP SITE NAME	PARISH	DOTD WELL NAME	DATE SAMPLED	OWNER	DEPTH (IN FEET) (FEET)	WELL USE
199003	E BATON ROUGE	EB-630	3/10/2003	BATON ROUGE WATER CO.	2253	PUBLIC SUPPLY
200012	E BATON ROUGE	EB-770	3/10/2003	CITY OF ZACHARY	2080	PUBLIC SUPPLY
200014	E FELICIANA	EF-272	3/10/2003	LA. WAR VETS HOME	1325	PUBLIC SUPPLY
199701	W FELICIANA	WF-264	3/11/2003	W. FELICIANA PARISH UTILITIES	960	PUBLIC SUPPLY
200013	POINTE COUPEE	PC-275	3/17/2003	PRIVATE OWNER	1912	DOMESTIC
198613	LIVINGSTON	LI-185	4/7/2003	CITY OF DENHAM SPRINGS	2610	PUBLIC SUPPLY
200015	LIVINGSTON	LI-229	4/7/2003	WARD 2 WATER DISTRICT	1826	PUBLIC SUPPLY
200017	LIVINGSTON	LI-257	4/7/2003	VILLAGE OF ALBANY	1842	PUBLIC SUPPLY
199324	TANGIPAHOA	TA-560	4/7/2003	TOWN OF ROSELAND	2032	PUBLIC SUPPLY
200016	ST HELENA	SH-104	4/7/2003	CAL MAINE FOODS	1652	INDUSTRIAL
199404	TANGIPAHOA	TA-826	5/19/2003	CITY OF PONCHATOULA	2015	PUBLIC SUPPLY
200019	ST TAMMANY	ST-763	5/19/2003	LDOTD	2230	PUBLIC SUPPLY
200005	ST TAMMANY	ST-995	5/19/2003	PRIVATE OWNER	2290	IRRIGATION
200020	ST TAMMANY	ST-FOLSOM	5/19/2003	VILLAGE OF FOLSOM	2265	PUBLIC SUPPLY
200018	WASHINGTON	WA-248	5/19/2003	TOWN OF FRANKLINTON	2700	PUBLIC SUPPLY

Table 14-3 Summary of Water Quality Data

Well Name	PH SU	SALINITY PPT	SP. COND. (FIELD) MMHOS/CM	TEMP. DEG. C	ALK. PPM	NH3 PPM	CL PPM	COLOR PCU	HARD. PPM	NITRITE-NITRATE (AS N) PPM	TKN PPM	TOT. P PPM	SP. COND. (LAB) UMHOS/CM	SO4 PPM	TDS PPM	TSS PPM	TURBIDITY NTU
	FIELD PARAMETERS				CONVENTIONAL PARAMETERS												
EB-630	8.96	0.17	0.371	30.76	181	0.17	10.3	11	<5	<0.05	0.59	0.24	357	11.1	241	<4	1.7
EB-630*	8.96	0.17	0.371	30.76	180	0.16	7.9	10	<5	<0.05	0.76	0.23	342	10.4	229	<4	1.2
EB-770	8.68	0.14	0.298	23.93	150	<0.1	5.5	<5	<5	<0.05	0.27	0.26	289	9.2	197	<4	1.7
EF-272	8.89	0.15	0.318	22.63	167	<0.1	3.9	<5	<5	0.29	<0.1	0.39	314	7.7	213	<4	<1
WF-264	8.66	0.12	0.265	24.30	141	0.25	2.5	<5	8.3	<0.05	0.26	0.11	266	8.3	181	<4	<1
PC-275	9.06	0.31	0.64	25.43	305	0.56	30.3	28	<5	<0.05	0.56	0.42	653	6.1	374	<4	<1
PC-275*	9.06	0.31	0.64	25.43	305	0.58	25.4	28	<5	<0.05	0.62	0.43	651	6	370	<4	<1
LI-185	8.71	0.12	0.263	31.62	132	<0.1	2.7	<5	6.8	<0.05	0.11	0.2	242	8.8	166	<4	<1
LI-229	8.60	0.14	0.303	26.50	156	0.13	2.4	<5	<5	<0.05	0.26	0.19	281	8.4	173	<4	<1
LI-257	8.37	0.11	0.234	29.20	116	<0.1	2.6	<5	<5	<0.05	0.11	0.29	221	9.1	155	<4	<1
TA-560	8.48	0.10	0.21	27.94	102	<0.1	2.3	<5	<5	<0.05	0.18	0.61	200	8.4	134	<4	<1
SH-104	9.19	0.19	0.395	26.75	207	0.21	2.6	6	<5	<0.05	0.27	0.49	368	7.9	220	<4	<1
SH-104*	9.19	0.19	0.395	26.75	208	0.21	2.6	7	<5	<0.05	0.29	0.47	371	8	236	<4	<1
TA-826	8.22	0.15	0.323	31.12	162	0.19	2.3	12	6.4	<0.05	0.25	0.26	311	10.5	217	<4	<1
ST-763	8.35	0.38	0.797	32.20	238	0.75	113	16	8.9	<0.05	0.89	0.22	788	4.9	454	<4	<1
ST-995	8.14	0.09	0.187	27.63	87.2	0.15	2.3	<5	8.1	<0.05	0.17	0.53	183	9.3	169	<4	<1
ST-FOLSOM	8.25	0.12	0.253	28.60	123	<0.1	4.1	7	<5	0.06	<0.1	0.22	248	10.2	180	<4	<1
WA-248	8.51	0.17	0.351	31.58	169	0.4	7.9	22	<5	<0.05	0.4	0.56	338	8.5	221	<4	<1

*Denotes duplicate sample.

Table 14-4 Summary of Inorganic Data

WELL NAME	ANTIMONY PPB	ARSENIC PPB	BARIUM PPB	BERYLLIUM PPB	CADMIUM PPB	CHROMIUM PPB	COPPER PPB	IRON PPB	LEAD PPB	MERCURY PPB	NICKEL PPB	SELENIUM PPB	SILVER PPB	THALLIUM PPB	ZINC PPB
EB-630	<5	<5	9.4	<1	<1	<5	5.8	51.4	<10	<0.05	<5	<5	<1	<5	<10
EB-630*	<5	<5	9.9	<1	<1	<5	6.4	85.2	<10	<0.05	<5	<5	<1	<5	<10
EB-770	<5	<5	7.5	<1	<1	<5	<5	659	<10	<0.05	<5	<5	<1	<5	217
EF-272	<5	<5	3.3	<1	<1	<5	<5	<20	<10	<0.05	<5	<5	<1	<5	<10
WF-264	<5	<5	42.8	<1	<1	<5	<5	46	<10	<0.05	<5	<5	<1	<5	<10
PC-275	<5	<5	9.1	<1	<1	<5	<5	<20	<10	<0.05	<5	<5	<1	<5	30.3
PC-275*	<5	<5	8.8	<1	<1	<5	<5	<20	<10	<0.05	<5	<5	<1	<5	27.7
LI-185	<5	<5	19.2	<1	<1	<5	<5	86	<10	<0.05	<5	<5	<1	<5	<10
LI-229	<5	<5	11.4	<1	<1	<5	<5	666	<10	<0.05	<5	<5	<1	<5	757
LI-257	<5	<5	6.7	<1	<1	<5	<5	42	<10	<0.05	<5	<5	<1	<5	<10
TA-560	<5	<5	<1	<1	<1	<5	<5	38.2	<10	<0.05	<5	<5	<1	<5	<10
SH-104	<5	<5	3	<1	<1	<5	<5	<20	<10	<0.05	<5	<5	<1	<5	<10
SH-104*	<5	<5	3	<1	<1	<5	<5	<20	<10	<0.05	<5	<5	<1	<5	10.7
TA-826	<5	<5	26.8	<1	<1	<5	<5	<20	<10	<0.05	<5	<5	<1	<5	19.4
ST-763	<5	<5	29.2	<1	<1	<5	<5	<20	<10	<0.05	<5	<5	<1	<5	<10
ST-995	5.3	<5	10.7	<1	<1	<5	<5	<20	<10	<0.05	<5	<5	<1	<5	<10
ST-FOLSOM	<5	<5	1.9	<1	<1	<5	<5	<20	<10	<0.05	<5	<5	<1	<5	<10
WA-248	5.2	<5	5.1	<1	<1	<5	<5	<20	<10	<0.05	<5	<5	<1	<5	40.1
WA-248*	<5	<5	5	<1	<1	<5	<5	<20	<10	<0.05	<5	<5	<1	<5	25.6

* Denotes duplicate sample.

Table 14-5 Current Year Water Quality Statistics

PARAMETER	MINIMUM	MAXIMUM	AVERAGE
Field Temperature (Deg. C.)	22.63	32.2	28.1
Field pH (SU)	8.14	9.19	8.67
Field Sp. Conductivity (mmhos/cm)	0.187	0.797	0.370
Field Salinity (ppt)	0.09	0.38	0.17
Alkalinity (ppm)	87.2	305	173.6
Chloride (ppm)	2.3	113	12.6
Color (PCU)	<5	28	10.9
Specific Conductance (umhos/cm)	183	788	356.1
Sulfate (ppm)	4.9	11.1	8.5
TDS (ppm)	134	454	229.2
TSS (ppm)	<4	<4	<4
Turbidity (NTU)	<1	1.7	1.1
Ammonia (ppm)	<0.1	0.75	0.25
Hardness (ppm)	<5	8.9	5.7
Nitrogen, Nitrite + Nitrate (ppm)	<0.05	0.29	0.06
TKN (ppm)	<0.1	0.89	0.35
Phosphorus as P (ppm)	0.11	0.61	0.35

Table 14-6 Current Year Inorganic Statistics

PARAMETER	MINIMUM	MAXIMUM	AVERAGE
Antimony (ppb)	<5	5.3	5.0
Arsenic (ppb)	<5	<5	<5
Barium (ppb)	<1	42.8	11.3
Beryllium (ppb)	<1	<1	<1
Cadmium (ppb)	<1	<1	<1
Chromium (ppb)	<5	<5	<5
Copper (ppb)	<5	6.4	5.1
Iron (ppb)	<20	666	99.7
Lead (ppb)	<10	<10	<10
Mercury (ppb)	<0.05	<0.05	<0.05
Nickel (ppb)	<5	<5	<5.0
Selenium (ppb)	<5	<5	<5.0
Silver (ppb)	<1	<1	<1
Thallium (ppb)	<5	<5	<5
Zinc (ppb)	<10	757	65.2

Table 14-7 Three-year Water Quality Statistics

PARAMETER	FY 1997 AVERAGE	FY 2000 AVERAGE	FY 2003 AVERAGE
Field Temperature (Deg. C.)	29.00	28.84	28.13
Field pH (SU)	7.64	Invalid Data	8.67
Field Sp. Conductivity (mmhos/cm)	0.35	0.38	0.37
Field Salinity (ppt)	0.17	0.18	0.17
Alkalinity (ppm)	137.29	167.16	163.14
Chloride (ppm)	12.11	17.91	14.37
Color (PCU)	8.13	5.94	10.33
Specific Conductance (umhos/cm)	335.00	393.96	343.00
Sulfate (ppm)	8.80	7.30	8.05
TDS (ppm)	258.25	251.39	221.38
TSS (ppm)	4.06	8.59	4.00
Turbidity (NTU)	0.75	1.14	1.08
Ammonia (ppm)	0.31	0.27	0.24
Hardness (ppm)	6.90	5.87	10.84
Nitrogen, Nitrite + Nitrate (ppm)	<0.05	<0.02	0.06
TKN (ppm)	0.19	0.47	0.33
Phosphorus as P (ppm)	0.20	0.28	0.32

Table 14-8 Three-year Inorganic Statistics

PARAMETER	FY 1997 AVERAGE	FY 2000 AVERAGE	FY 2003 AVERAGE
Antimony (ppb)	7.78	<5	<5
Arsenic (ppb)	<5	<5	<5
Barium (ppb)	24.20	11.65	22.20
Beryllium (ppb)	<1	<1	<1
Cadmium (ppb)	1.13	1.02	<1
Chromium (ppb)	<5	<5	<5
Copper (ppb)	<5	14.01	<5
Iron (ppb)	27.46	28.25	86.47
Lead (ppb)	<10	<10	<10
Mercury (ppb)	<0.05	<0.05	<0.05
Nickel (ppb)	<5	<5	<5
Selenium (ppb)	<5	<5	<5
Silver (ppb)	<1	<1	<1
Thallium (ppb)	<5	<5	<5
Zinc (ppb)	<10	22.92	56.80

Table 14-9 List of VOC Analytical Parameters
BASELINE MONITORING PROJECT
VOLATILE ORGANICS BY EPA METHOD 624

COMPOUND	PQL (ppb)
CHLOROMETHANE	2
VINYL CHLORIDE	2
BROMOMETHANE	2
CHLOROETHANE	2
TRICHLOROFLUOROMETHANE	2
1,1-DICHLOROETHENE	2
METHYLENE CHLORIDE	2
TRANS-1,2-DICHLOROETHENE	2
METHYL-t-BUTYL ETHER	2
1,1-DICHLOROETHANE	2
CHLOROFORM	2
1,1,1-TRICHLOROETHANE	2
CARBON TETRACHLORIDE	2
BENZENE	2
1,2-DICHLOROETHANE	2
TRICHLOROETHENE	2
1,2-DICHLOROPROPANE	2
BROMODICHLOROMETHANE	2
CIS-1,3-DICHLOROPROPENE	2
TOLUENE	2
TRANS-1,3-DICHLOROPROPENE	2
1,1,2-TRICHLOROETHANE	2
TETRACHLOROETHENE	2
DIBROMOCHLOROMETHANE	2
CHLOROBENZENE	2
ETHYLBENZENE	2
P&M XYLENE	4
O-XYLENE	2
STYRENE	2
BROMOFORM	2
1,1,2,2-TETRACHLOROETHANE	2
1,3-DICHLOROBENZENE	2
1,4-DICHLOROBENZENE	2
1,2-DICHLOROBENZENE	2

PQL = Practical Quantitation Limit
ppb = parts per billion

Table 14-10 List of Semivolatile Analytical Parameters

BASELINE MONITORING PROJECT

SEMIVOLATILE ORGANICS BY EPA METHOD 8270

COMPOUND	PQL (ppb)
Acenaphthene	10
Acenaphthylene	10
Anthracene	10
Benzidine	30
Benzo(a)anthracene	10
Benzo(b)fluoranthene	10
Benzo(k)fluoranthene	10
Benzo(g,h,i)perylene	10
Benzo(a)Pyrene	10
4-Bromophenyl phenyl ether	10
Butylbenzylphthalate	10
Bis(2-chloroethoxy)methane	10
Bis(2-chloroethyl)ether	10
2,2-Oxybis(1-chloropropane)	10
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	10
2-Chloronaphthalene	10
2-Chlorophenol (o-Chlorophenol)	10
4-Chlorophenyl phenyl ether	10
Chrysene	10
Dibenz(a,h)anthracene	10
Di-n-butylphthalate	10
1,2-Dichlorobenzene (o-Dichlorobenzene)	10
1,3-Dichlorobenzene (m-Dichlorobenzene)	10
1,4-Dichlorobenzene (p-Dichlorobenzene)	10
3,3'-Dichlorobenzidine	20
2,4-Dichlorophenol	10
Diethylphthalate	10
2,4-Dimethylphenol	10
Dimethylphthalate	10
4,6-Dinitro-2-methylphenol (4,6-Dinitro-o-cresol)	25
2,4-Dinitrophenol	25
2,4-Dinitrotoluene	10
2,6-Dinitrotoluene	10
Di-n-octylphthalate	10
1,2-Diphenylhydrazine (as azobenzene)	10
Bis(2-ethylhexyl)phthalate	10
Fluoranthene	10
Fluorene	10
Hexachlorobenzene	10
Hexachlorobutadiene	10

Table 14-10 (Cont'd)
Semivolatile Parameters

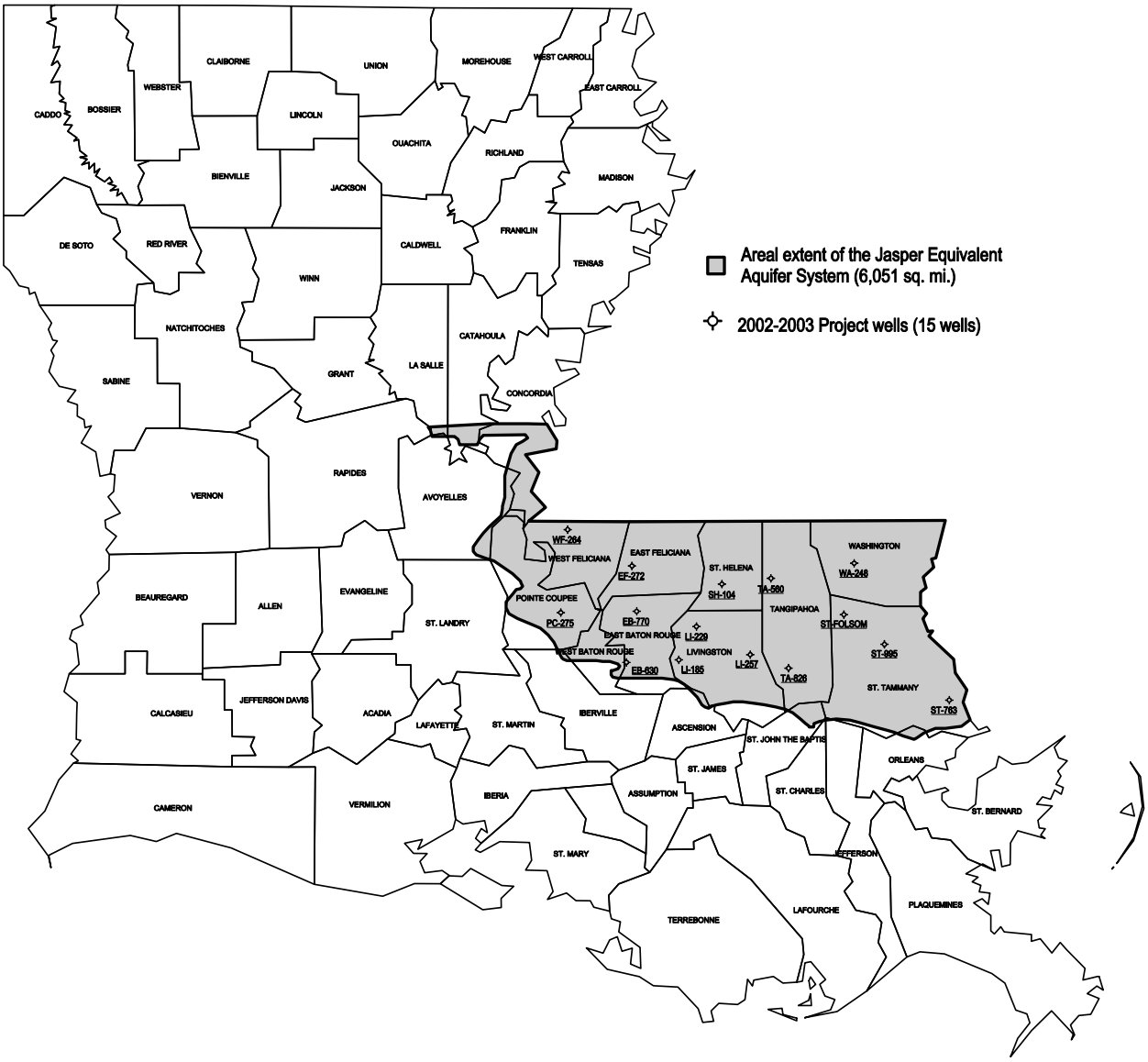
COMPOUND	PQL (ppb)
Hexachlorocyclopentadiene	10
Hexachloroethane	10
Indeno(1,2,3-cd)pyrene	10
Isophorone	10
Naphthalene	20
Nitrobenzene	10
2-Nitrophenol (o-Nitrophenol)	10
4-Nitrophenol (p-Nitrophenol)	25
N-Nitrosodiphenylamine	10
N-Nitroso-di-n-propylamine	10
N-Nitrosodiphenylamine (Diphenylamine)	10
Pentachlorophenol	25
Phenathrene	10
Phenol	10
Pyrene	10
1,2,4-Trichlorobenzene	10
2,4,6-Trichlorophenol	10

Table 14-11 List of Pesticide and PCB Analytical Parameters

EPA METHOD 8080

COMPOUND	PQL (ppb)
Aldrin	0.0500
Alpha BHC	0.0500
Beta BHC	0.0500
Delta BHC	0.0500
Gamma BHC (Lindane)	0.0500
Chlordane (technical)	0.500
4,4'-DDD (p,p'-DDD)	0.100
4,4'-DDE (p,p'-DDE)	0.100
4,4'-DDT (p,p'-DDT)	0.100
Dieldrin	0.100
Endosulfan I (alpha-Endosulfan)	0.0500
Endosulfan II (beta-Endosulfan)	0.100
Endosulfan Sulfate	0.100
Endrin	0.100
Endrin Aldehyde	0.100
Heptachlor	0.0500
Heptachlor epoxide	0.0500
Toxaphene	5.00
Aroclor-1016	1.00
Aroclor-1221	1.00
Aroclor-1232	1.00
Aroclor-1242	1.00
Aroclor-1248	1.00
Aroclor-1254	1.00
Aroclor-1260	1.00

BASELINE MONITORING PROJECT WELLS OF THE JASPER EQUIVALENT AQUIFER SYSTEM



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

Figure 14-1 Location Plat, Jasper Equivalent Aquifer System

JASPER EQUIVALENT AQUIFER SYSTEM - pH (SU)

Baseline Monitoring Project, FY2002-2003

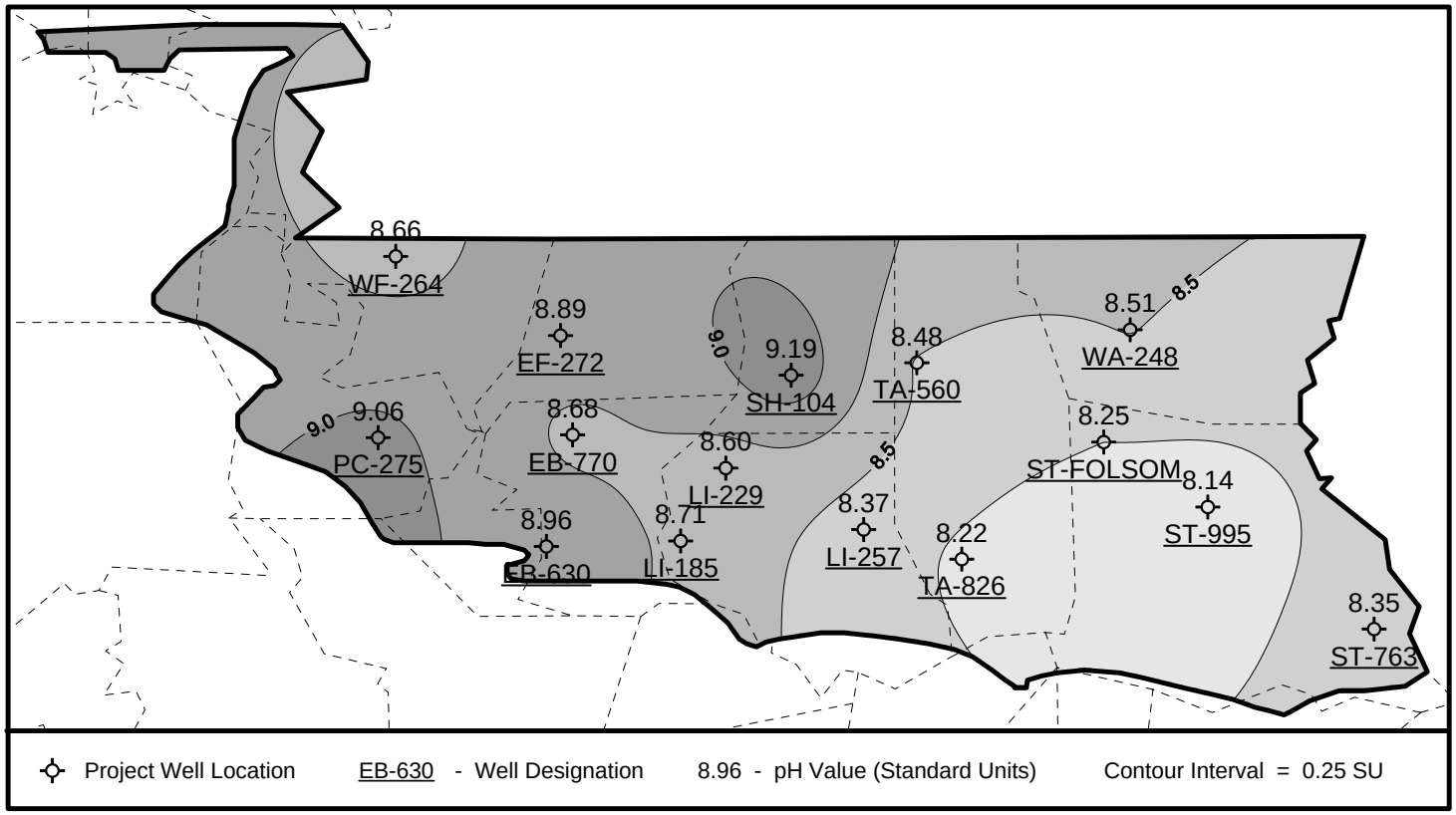


Figure 14-2 Map of pH Data

JASPER EQUIVALENT AQUIFER SYSTEM - TDS (ppm)

Baseline Monitoring Project, FY2002-2003

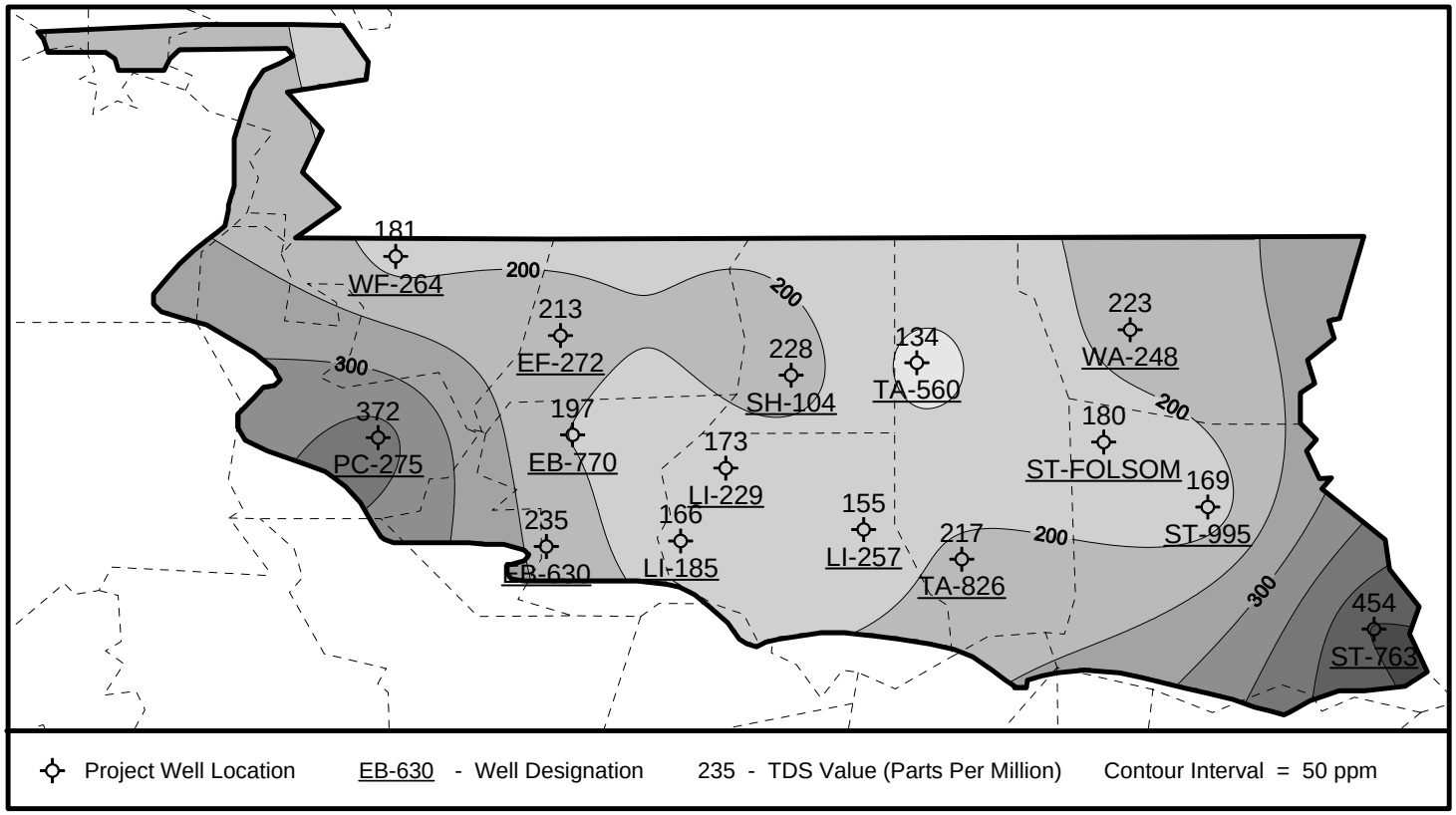


Figure 14-3 Map of TDS Data

JASPER EQUIVALENT AQUIFER SYSTEM - Chloride (ppm)

Baseline Monitoring Project, FY2002-2003

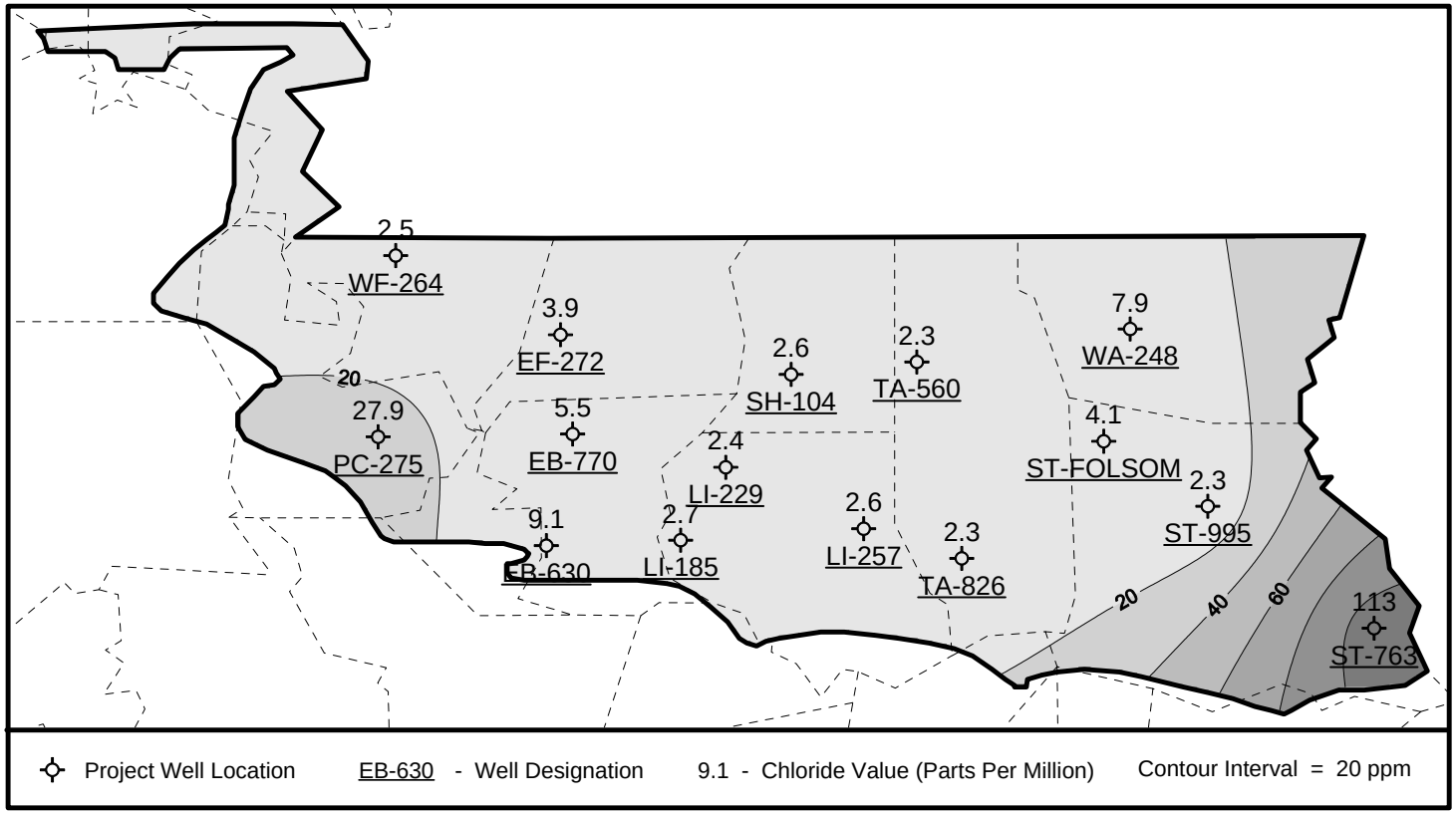


Figure 14-4 Map of Chloride Data

JASPER EQUIVALENT AQUIFER SYSTEM - Iron (ppb)

Baseline Monitoring Project, FY2002-2003

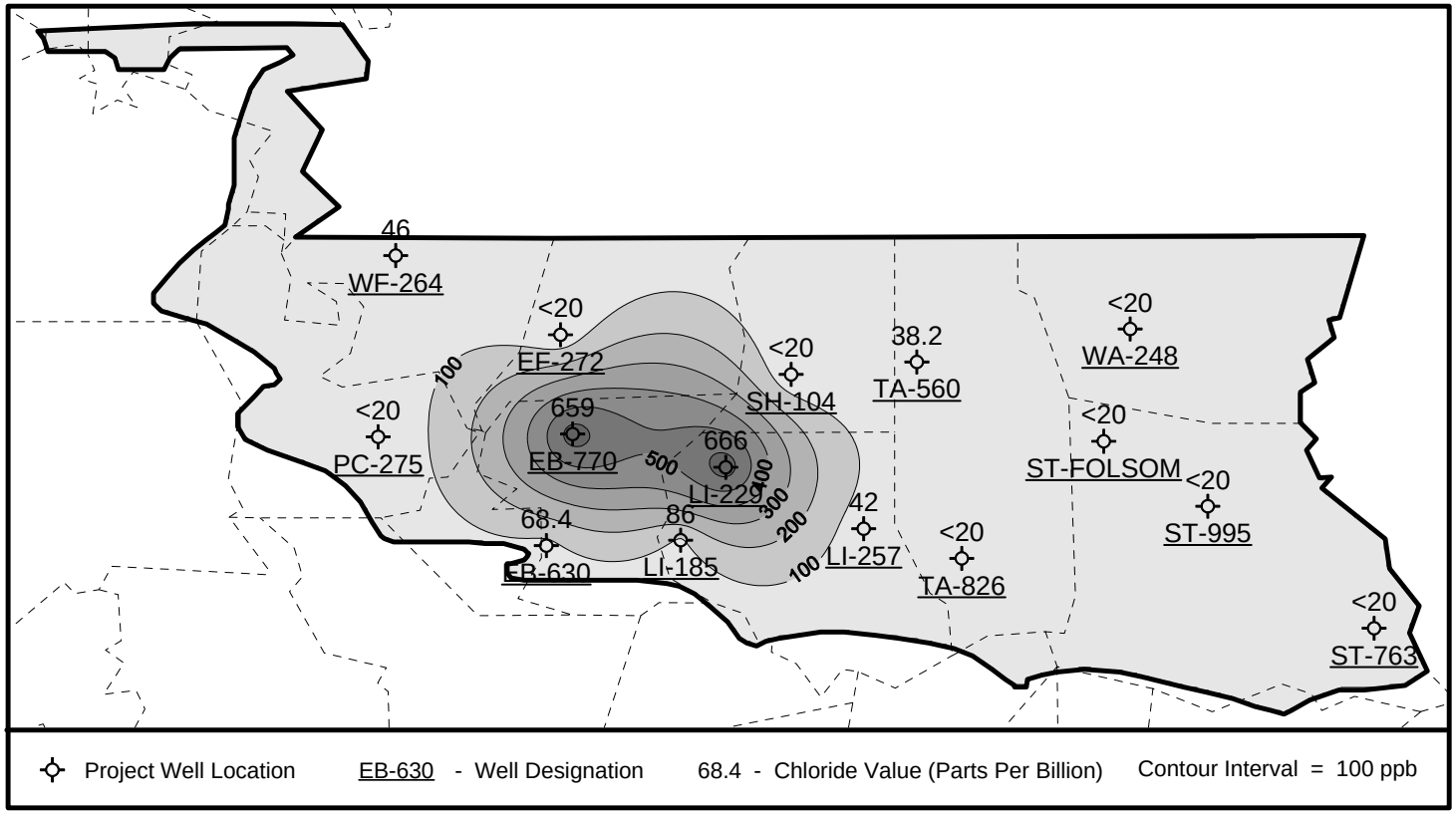


Figure 14-5 Map of Iron Data