

APPENDIX 1

**CARNAHAN BAYOU AQUIFER SUMMARY
BASELINE MONITORING PROJECT, EPA FY'98
(July 1997 Through June 1998)**

**PART VII
OF
TRIENNIAL SUMMARY REPORT
FOR THE
WATER QUALITY MANAGEMENT DIVISION
OF
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY**

PARTIAL FUNDING PROVIDED THROUGH CWA 106 GRANT

CARNAHAN BAYOU 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 VII-1 shows the geographic locations of the Carnahan Bayou Aquifer and the associated project wells, whereas Table VII-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 May of 1998, seven project wells were sampled which produce from the Carnahan Bayou Aquifer. Of these seven wells, five are classified as Public Supply, one is classified as Industrial, and one is Domestic. The wells are located in five parishes from the east central to the southwest part of the state.

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 VII-2. Those project inorganic (total metals) parameters analyzed in the laboratory are listed in Table VII-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 VII-4, VII-5, and VII-6 were included in this summary. The tables list the project analytes along with their Practical Quantitation Limits (PQLs) used during processing.

DISCUSSION OF WATER QUALITY DATA

FEDERAL PRIMARY DRINKING WATER STANDARDS: Laboratory data show that two project water wells in the Carnahan Bayou Aquifer that are both used as a public supply wells exceeded the Federal Maximum Contaminant Level (MCL) for Cadmium. A concentration of 6.1 ppb was reported for Vernon Parish well number V-566 and a concentration of 5.1 ppb was reported for Rapides Parish well number R-1210. It is believed that these concentrations are due to field contamination, however a final determination will be made pending further analyses.

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: Secondary standards are defined as non-enforceable taste, odor or appearance guidelines. Field and laboratory data contained in Tables VII-2 and VII-3 show that three of the wells sampled in the Carnahan Bayou Aquifer exceeded the Secondary Maximum Contaminant Levels (SMCL) for two analytes in this category.

IRON (SMCL=300 ppb):

CO-71 exceeded this secondary standard with a reported concentration of 3,664 ppb.

V-566 exceeded this secondary standard with a reported concentration of 3,732 ppb.

V-496 exceeded this secondary standard with a reported concentration of 1,647 ppb.

COLOR (SMCL=15 PCU):

V-496 exceeded this secondary standard with a reported concentration of 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 VII-3 show that four of the wells sampled in the Carnahan Bayou Aquifer exceeded the Action Level for Lead. A final determination as to the occurrence of these exceedances will be made pending further analyses.

V-566 exceeded this action level with a reported concentration of 31.4 ppb.

BE-405 exceeded this action level with a reported concentration of 40.6 ppb.

V-496 exceeded this action level with a reported concentration of 17.7 ppb.

R-1210 exceeded this action level with a reported concentration of 17.4 ppb.

R-1001 exceeded this action level with a reported concentration of 20.0 ppb.

QUANTIFIABLE CADMIUM AND LEAD VALUES: Table VII-3 shows that seven quantifiable values for Cadmium and seven quantifiable values for Lead were found in the laboratory analyses. These values are shaded in Table VII-3. It is believed that these values are due to the grade of acid that was used to preserve the samples. Resampling has been done on wells in other aquifers using a higher grade of acid so that a determination may be made on this matter.

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 VII-2 through VII-5.

SUMMARY AND RECOMMENDATIONS

In summary, the analytical data show the ground water from this aquifer to be of good quality, with the exception of the unconfirmed exceedances discussed previously. A final determination as to the occurrence of these exceedances will be made pending further analyses.

It is recommended that the several project wells assigned to the Carnahan Bayou 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 VII-1 List of Project Wells Sampled

PROJECT NUMBER	PARISH	WELL NUMBER	DATE SAMPLED	WELL OWNER	DEPTH (feet)	WELL USE	AQUIFER
9118	BEAUREGARD	BE-405	05/12/1998	BOISE CASCADE	1016	INDUSTRIAL	CARNAHAN BAYOU
9206	CONCORDIA	CO-71	05/11/1998	CONCORDIA W.W. DIST. NO.1	305	PUBLIC SUPPLY	CARNAHAN BAYOU
9312	GRANT	G-5061Z	05/11/1998	CLEVELAND CRAIG	275	DOMESTIC	CARNAHAN BAYOU
9514	RAPIDES	R-1001	05/11/1998	GARDENER WATER SYSTEM	1080	PUBLIC SUPPLY	CARNAHAN BAYOU
8615	RAPIDES	R-1210	05/12/1998	CITY OF ALEXANDRIA	2036	PUBLIC SUPPLY	CARNAHAN BAYOU
8621	VERNON	V-496	05/12/1998	U.S. ARMY/FORT POLK	1415	PUBLIC SUPPLY	CARNAHAN BAYOU
9515	VERNON	V-566	05/11/1998	HUTTON VOLUNTEER FIRE DEPT.	143	PUBLIC SUPPLY	CARNAHAN BAYOU

TABLE VII-2 Summary of Water Quality Data

WELL NUMBER	TEMP. OC	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	NITRITE-NITRATE (as N) ppm	TOT. P ppm	TKN ppm	TOC ppm	NH ₃ (as N) ppm
BE-405	26.60	7.88	0.358	0.17	<4.0	204.0	181.0	25.0	2.8	374.0	5.0	6.5	9.00	0.08	0.06	0.36	<2.00	0.19
BE-405*	26.60	7.88	0.358	0.17	<4.0	214.0	182.0	25.0	1.2	376.0	5.0	6.5	8.90	0.08	0.06	0.36	<2.00	0.30
CO-71	20.12	6.48	0.675	0.33	<4.0	402.0	355.0	260.0	45.0	698.0	10.0	8.4	21.20	0.08	0.67	1.04	<2.00	0.68
G-5061Z	22.89	7.66	0.28	0.13	<4.0	190.0	149.0	6.4	2.6	299.0	5.0	4.4	<1.25	0.08	0.26	0.75	<2.00	0.39
R-1001	27.60	7.38	0.426	0.20	<4.0	250.0	196.0	4.5	2.6	442.0	5.0	14.6	14.30	0.16	0.37	0.58	<2.00	<0.10
R-1210	29.65	7.15	0.343	0.16	<4.0	222.0	175.0	10.9	<1.0	355.0	5.0	9.0	3.70	2.17	0.18	0.43	<2.00	0.21
V-496	28.20	7.31	0.388	0.18	<4.0	244.0	176.0	96.4	6.4	402.0	20.0	22.6	5.00	0.18	0.08	0.76	<2.00	0.82
V-566	21.78	5.95	0.206	0.10	<4.0	190.0	60.6	28.4	10.0	218.0	10.0	21.2	11.20	0.08	0.56	0.43	<2.00	0.14

* Denotes Duplicate Sample

TABLE VII-3 Summary of Inorganic Data

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
BE-405	<5.0	<1.0	1017.0	<1.0	4.1	<5.0	<5.0	60.2	<0.05	<5.0	<5.0	<5.0	<10.0	<5.0	19.4
BE-405*	<5.0	<1.0	688.0	<1.0	5.0	<5.0	5.2	60.2	<0.05	5.2	<5.0	<5.0	40.6	<5.0	27.1
CO-71	<5.0	<1.0	<10.0	<1.0	5.0	<5.0	<5.0	3,664.0	<0.05	5.8	<5.0	<5.0	14.8	<5.0	32.3
G-5061Z	<5.0	<1.0	13.1	<1.0	<1.0	<5.0	<5.0	36.9	<0.05	<5.0	<5.0	<5.0	14.5	<5.0	20.4
R-1001	<5.0	<1.0	11.9	<1.0	5.0	<5.0	26.9	114.8	<0.05	<5.0	<2.0	<5.0	20.0	<5.0	33.7
R-1210	<5.0	<1.0	129.0	<1.0	5.1	<5.0	88.9	168.9	<0.05	6.8	<5.0	<5.0	17.4	<5.0	110.0
V-496	<5.0	3.6	54.6	<1.0	5.8	<5.0	<5.0	1,647.0	<0.05	6.0	<5.0	<5.0	17.7	<5.0	71.2
V-566	<5.0	<1.0	80.8	<5.0	6.1	<5.0	7.9	3,732.0	<0.05	6.7	<5.0	<5.0	31.4	<5.0	3470

* Denotes Duplicate Sample

Table VII-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 VII-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-ISOPRPYLTOLUENE	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 VII-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 methanesulfonate	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 VII-5 (Cont'd)
Semivolatile Parameters

COMPOUNDS	PQL (ppb)
3,3'-Dichlorobenzidine	20
Benzo(a)anthracene	10
Chrysene	10
Di-n-octylphthalate	10
7,12-Dimethylbenz(a)anthracene	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 VII-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 VII-6 List of Pesticide and PCB Analytical Parameters
BASELINE MONITORING PROJECT

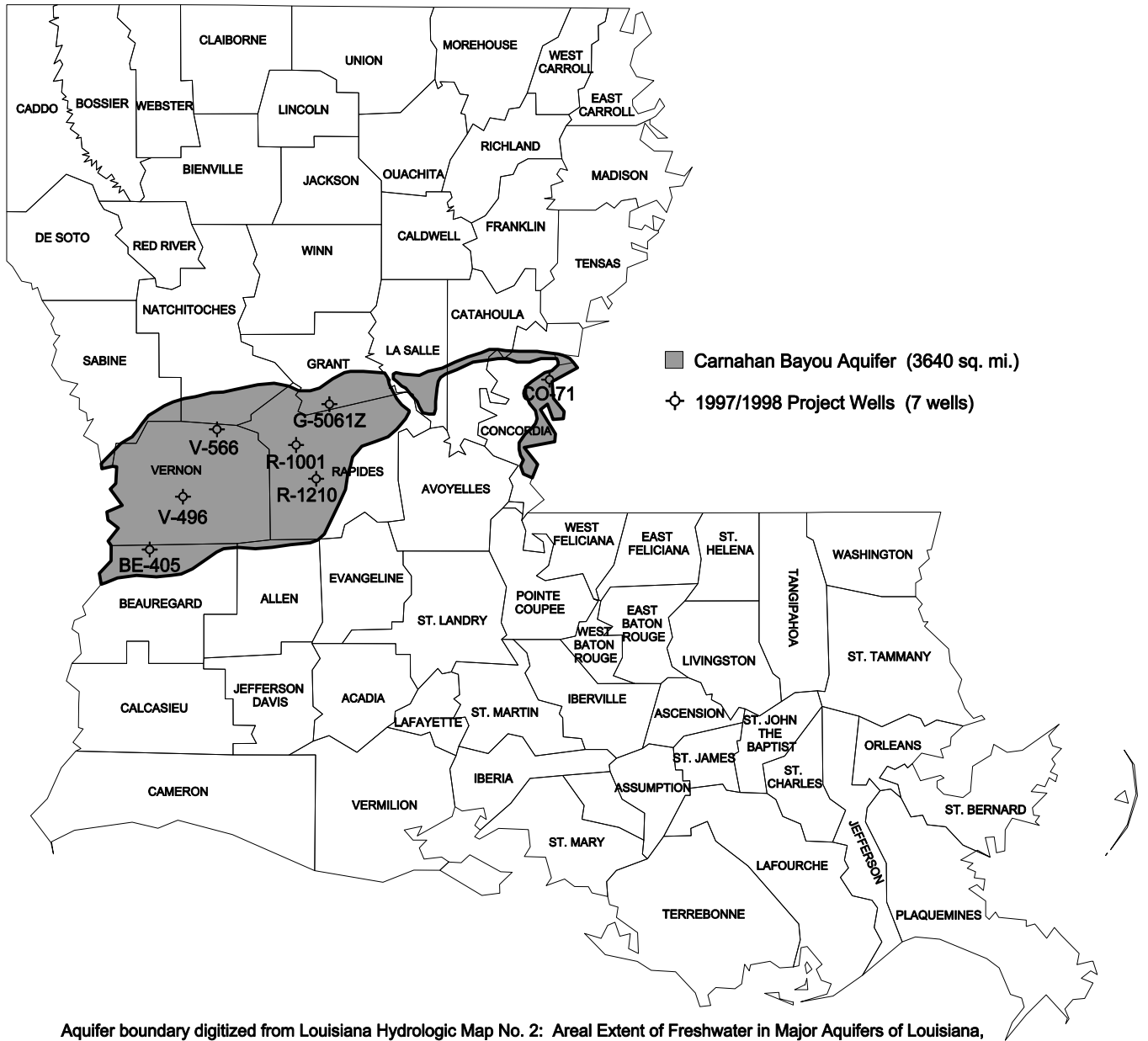
SEMIVOLATILE ORGANICS BY EPA METHOD 8270

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
Endosulfan II	2
Endrin Aldehyde	2
4,4'DDT	2
Endosulfan Sulfate	2

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

BASELINE MONITORING PROJECT WELLS OF THE CARNAHAN BAYOU AQUIFER



Aquifer boundary digitized from Louisiana Hydrologic Map No. 2: Areal Extent of Freshwater in Major Aquifers of Louisiana, Smoot, 1986; USGS/LDOTD Report 86-4150.

Figure VII-1 Location Plat, Carnahan Bayou Aquifer

CARNAHAN BAYOU AQUIFER - pH (SU)

Baseline Monitoring Project, FY97-98

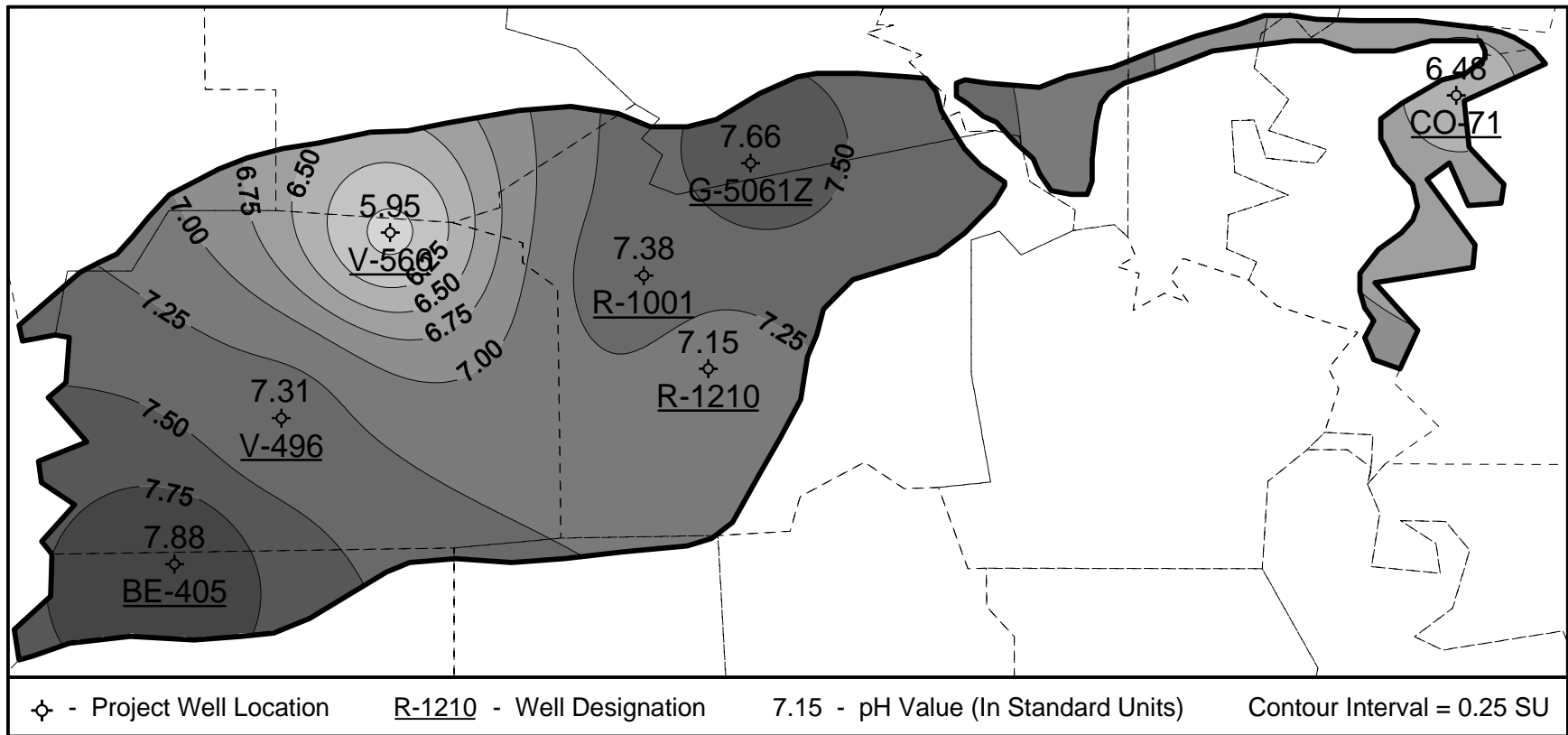


Figure VII-2 Map of pH Data

CARNAHAN BAYOU AQUIFER - TDS (ppm)

Baseline Monitoring Project, FY97-98

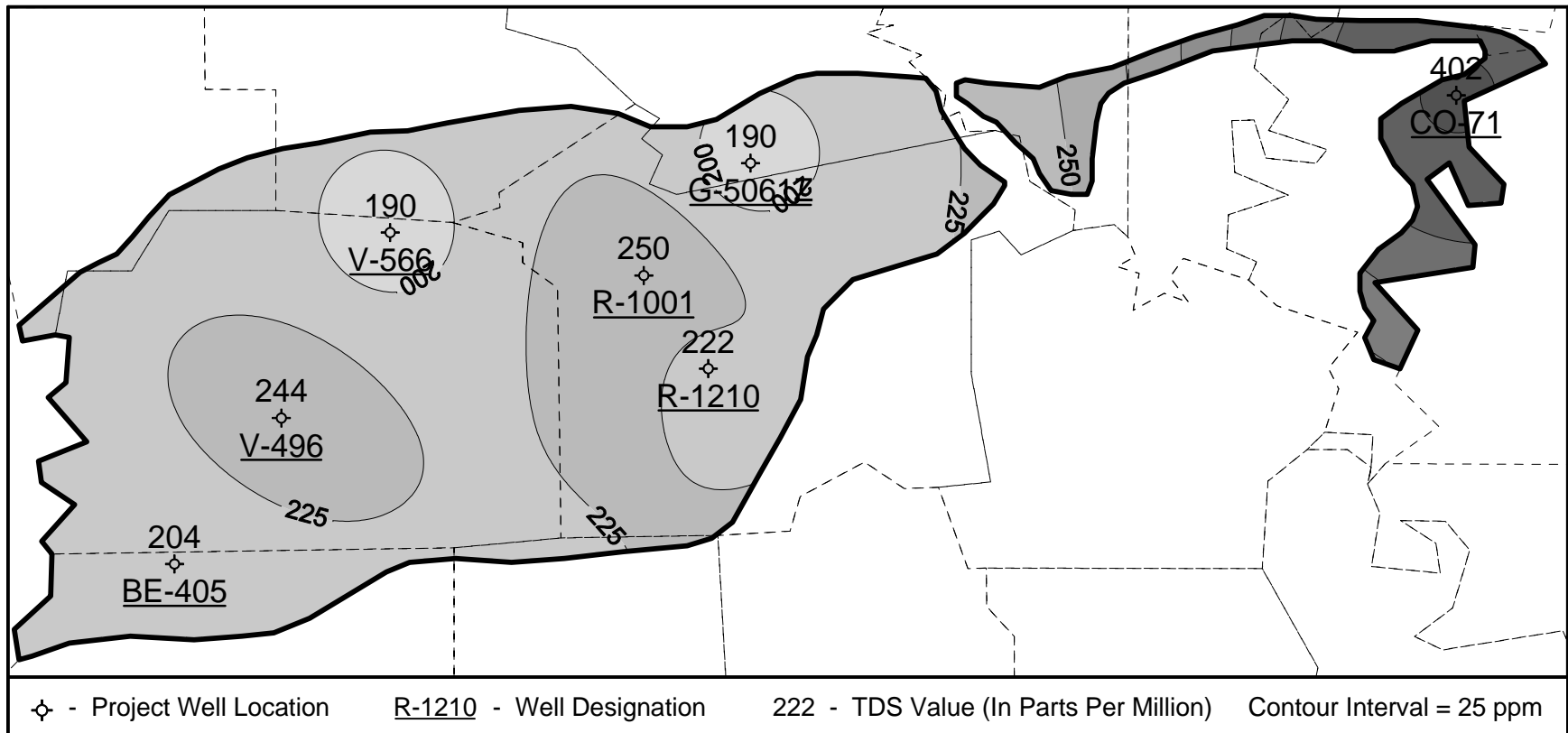


Figure VII-3 Map of TDS Data

CARNAHAN BAYOU AQUIFER - CHLORIDE (ppm)

Baseline Monitoring Project, FY97-98

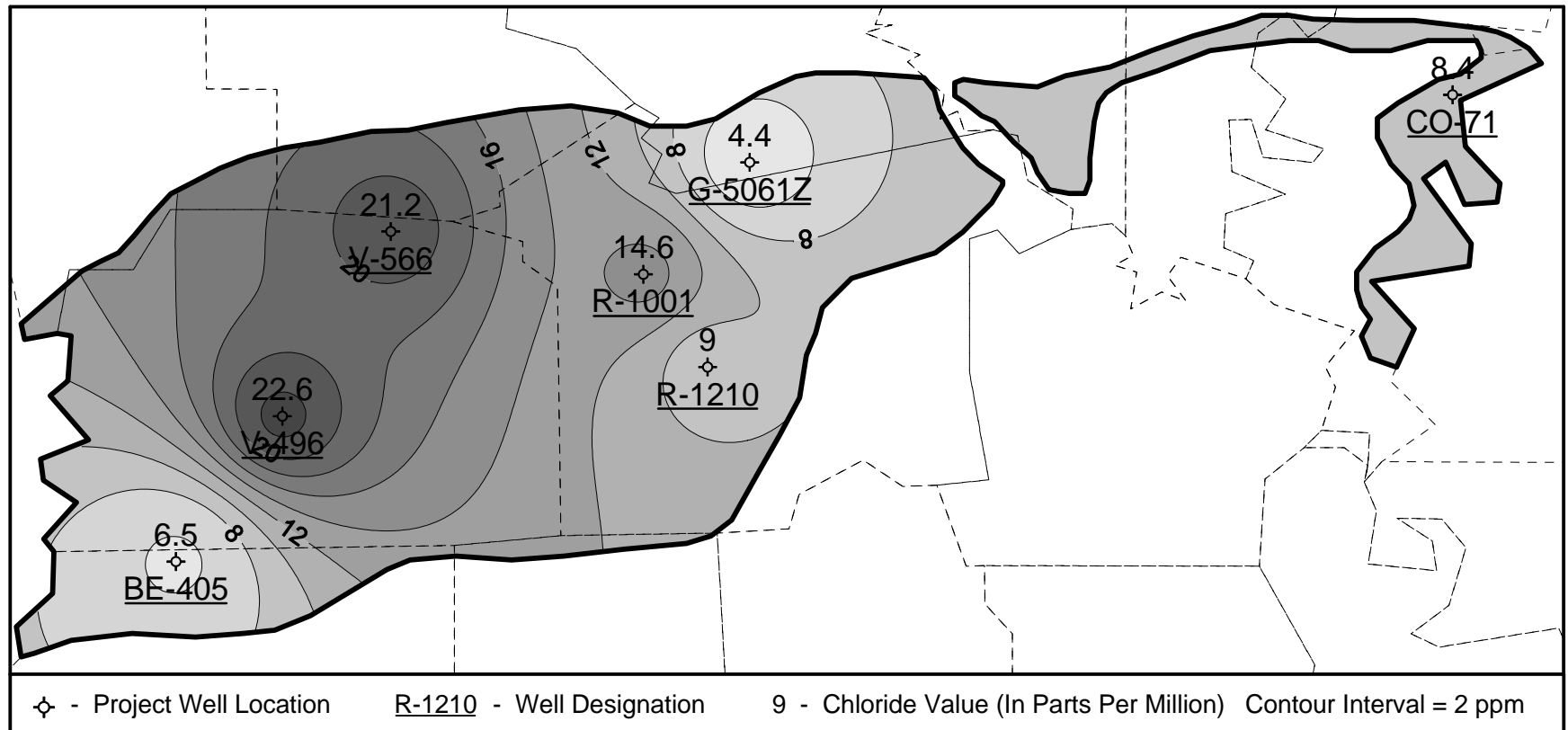


Figure VII-4 Map of Chloride Data

CARNAHAN BAYOU AQUIFER - IRON (ppb)

Baseline Monitoring Project, FY97-98

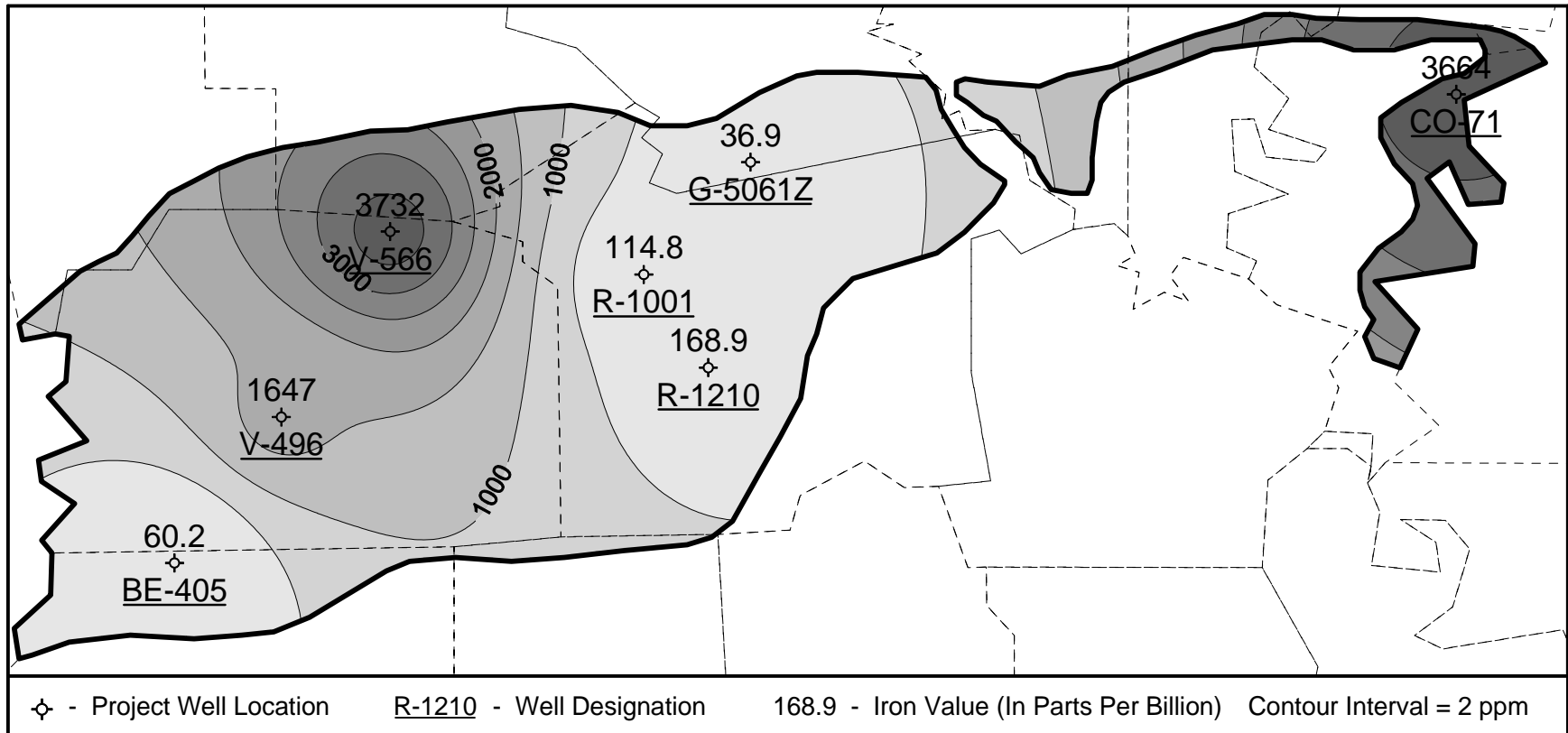


Figure VII-5 Map of Iron Data