

Exhibit IV-10 Existing Water Well Module Work Flow Diagram

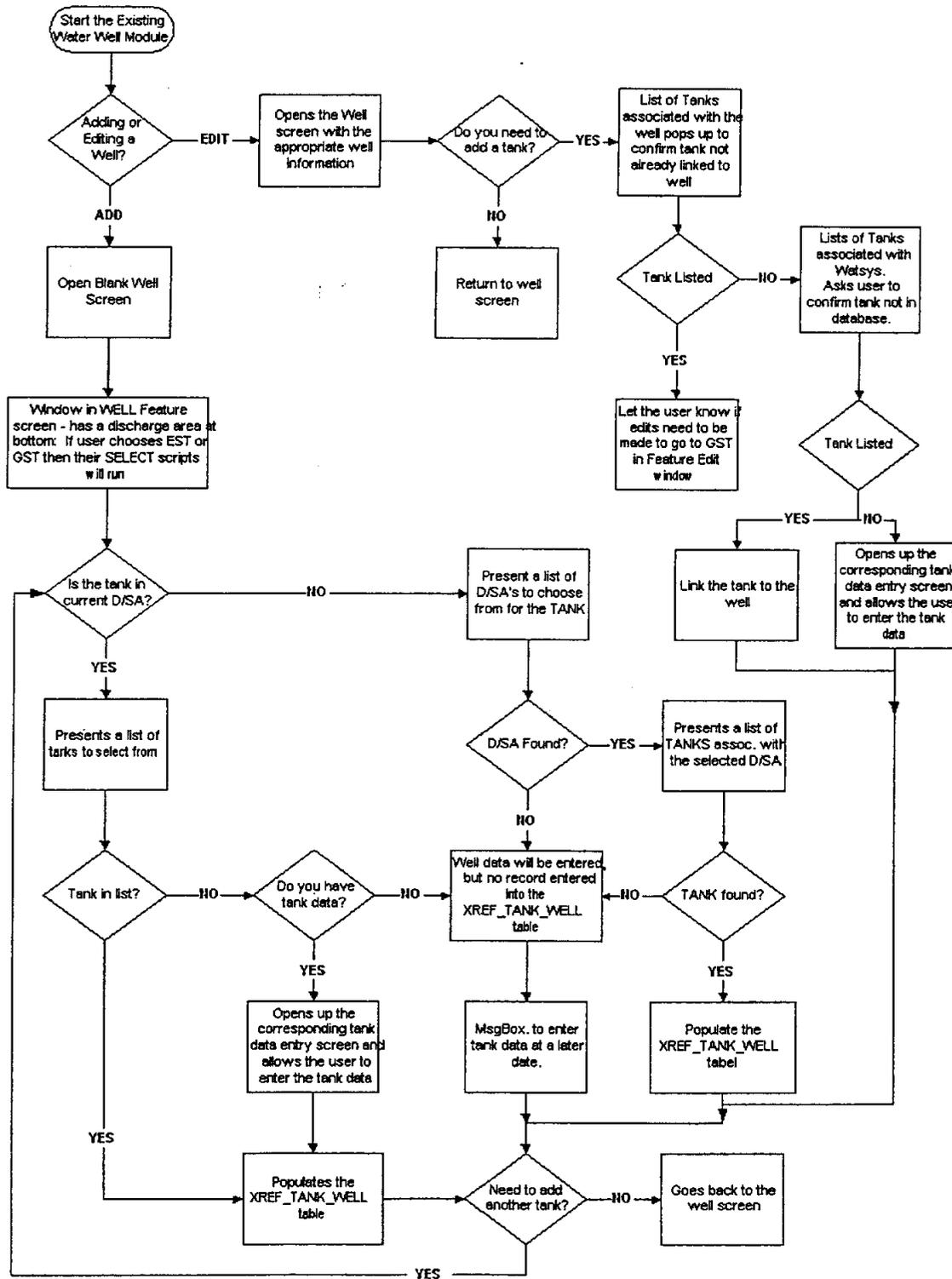


Exhibit IV-11 Ground Storage Tank Module Work Flow Diagram

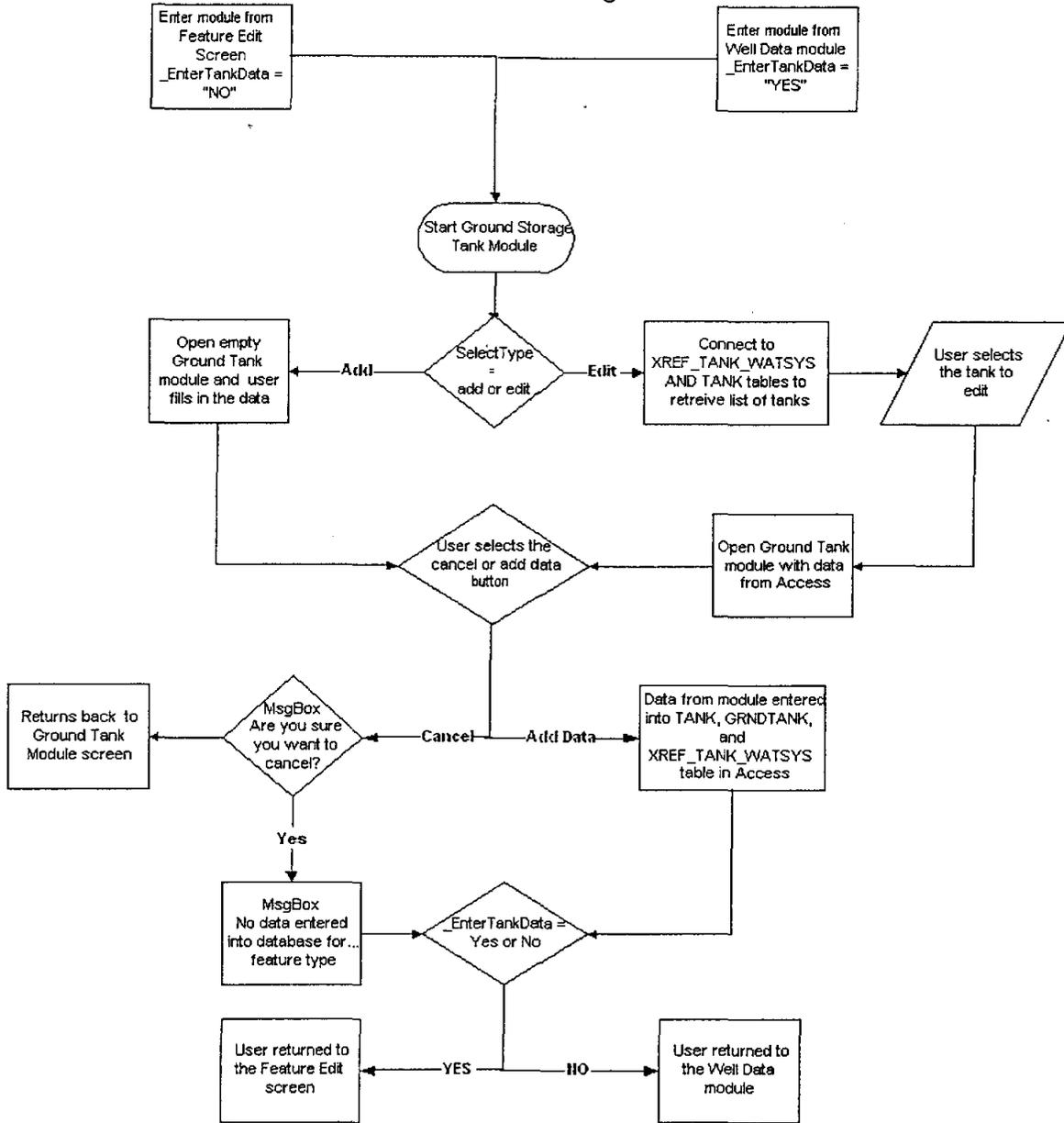


Exhibit IV-12
QA/QC Link Application
Work Flow Diagram

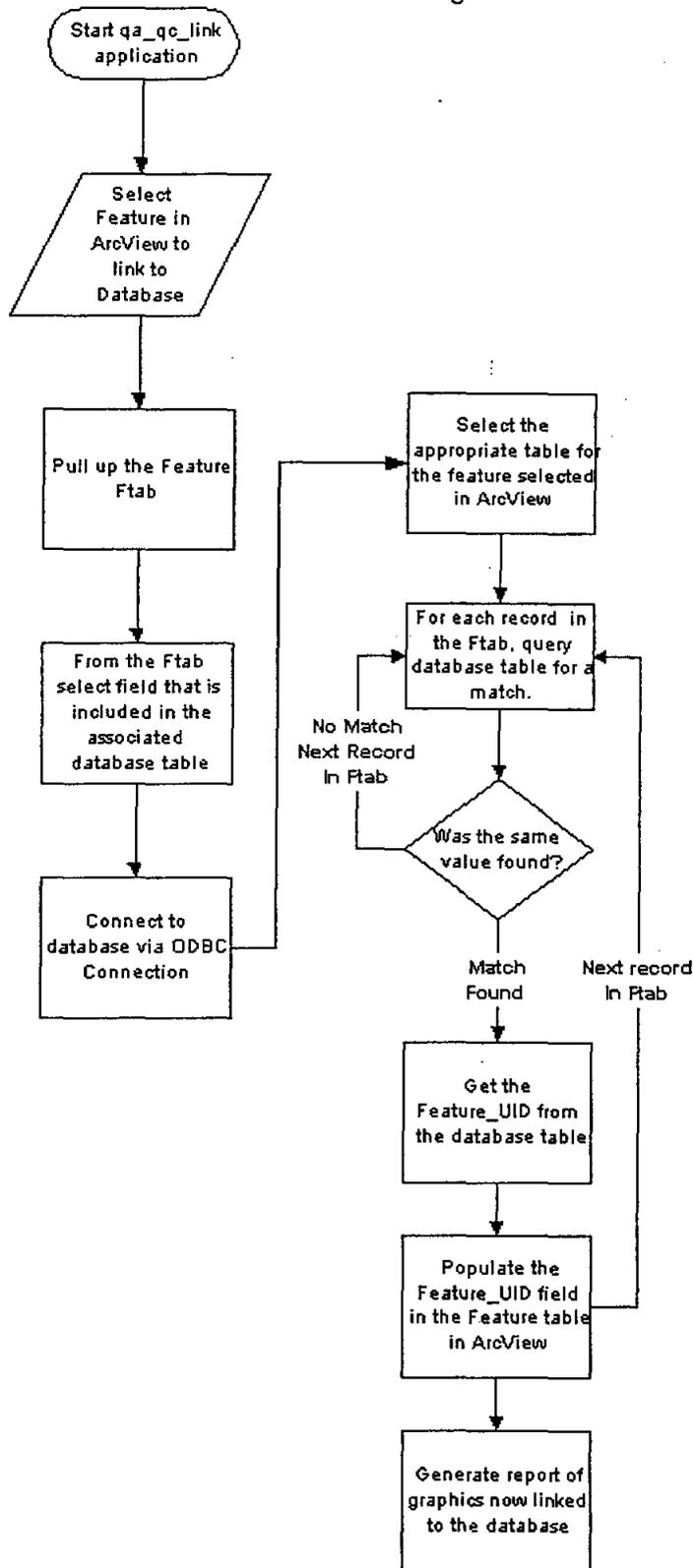


Exhibit IV-13
Well Query
Work Flow Diagram

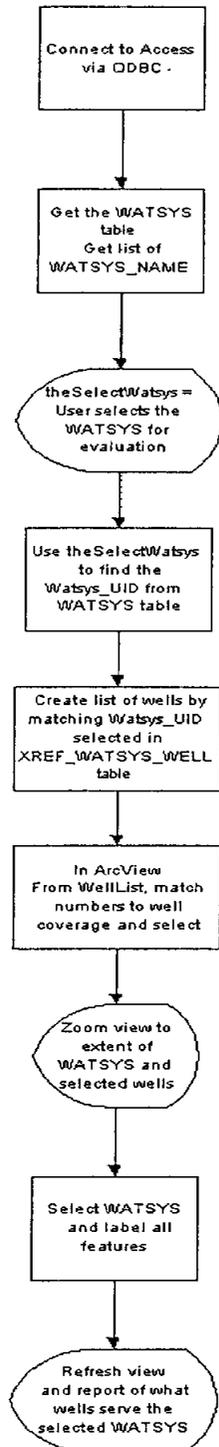


Exhibit IV-14
District/Service Area Features Query
Work Flow Diagram

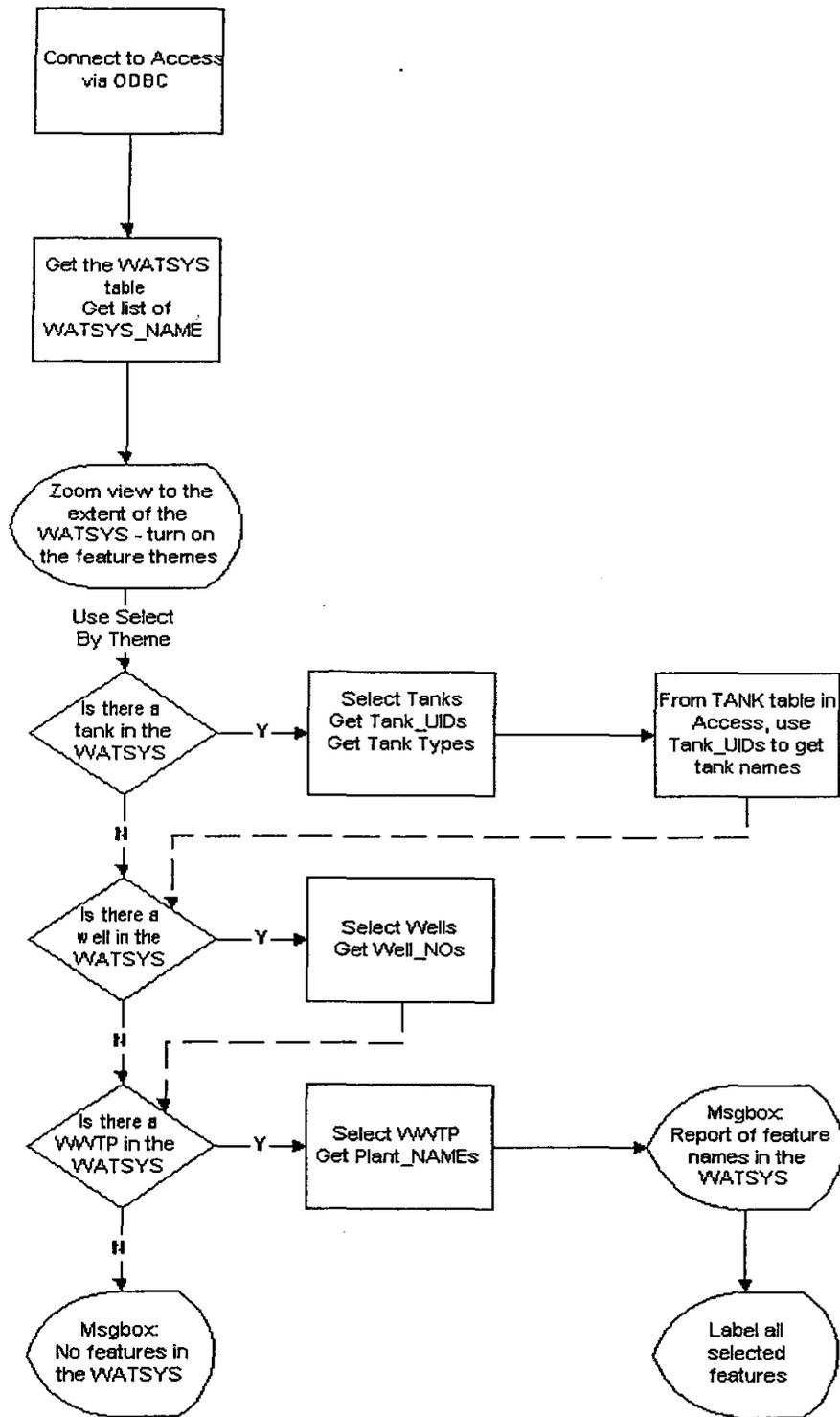
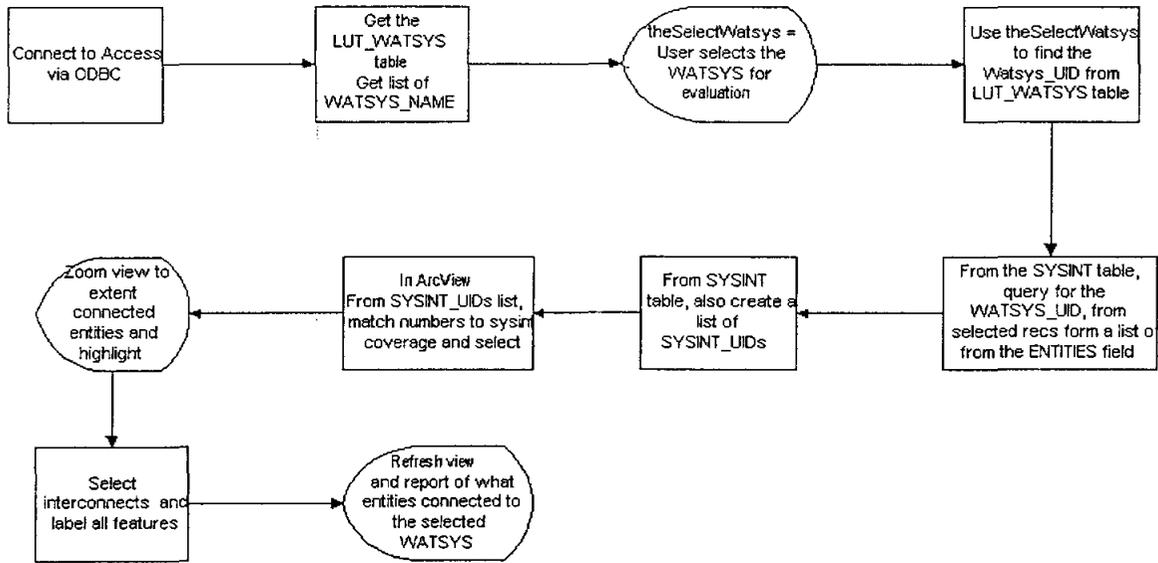


Exhibit IV-15
System Interconnect Query
Work Flow Diagram



**Exhibit IV-16
Age of Wells Query
Work Flow Diagram**

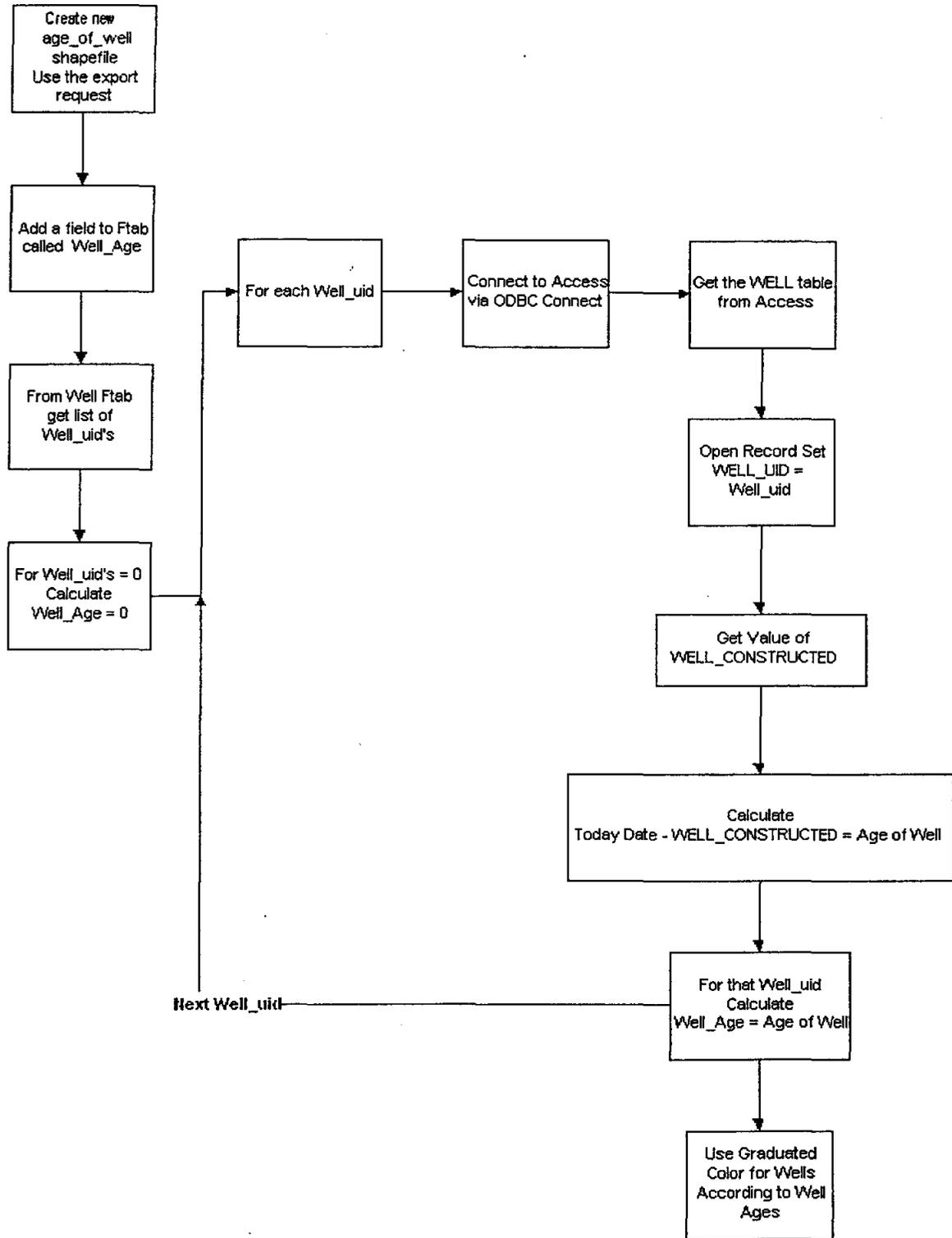
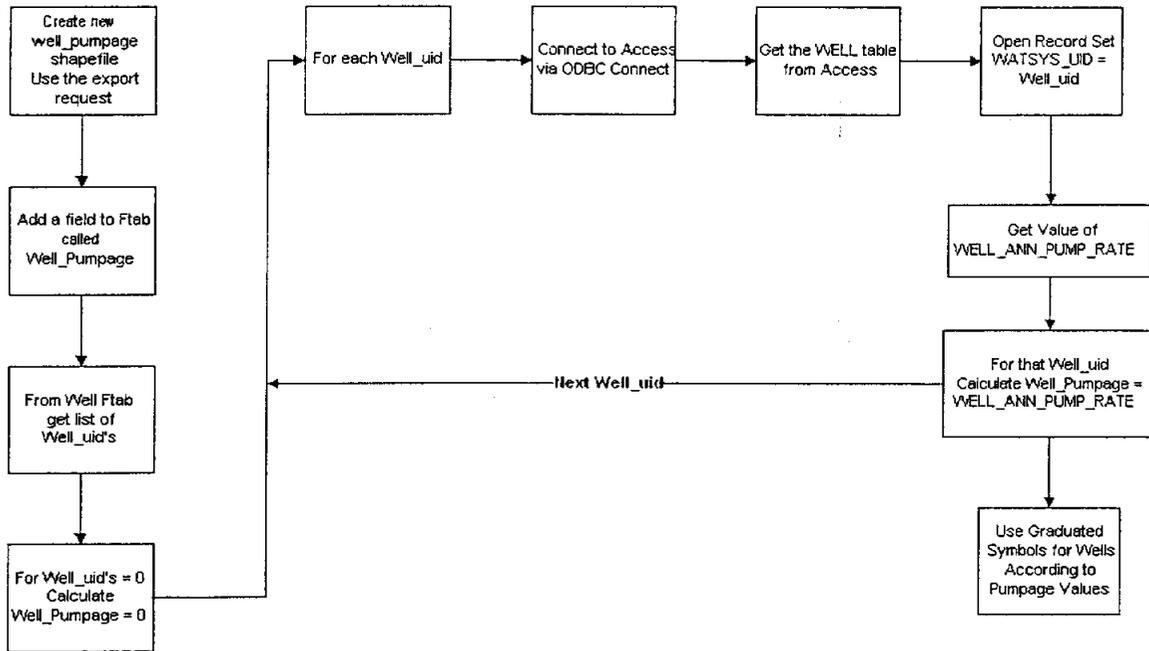
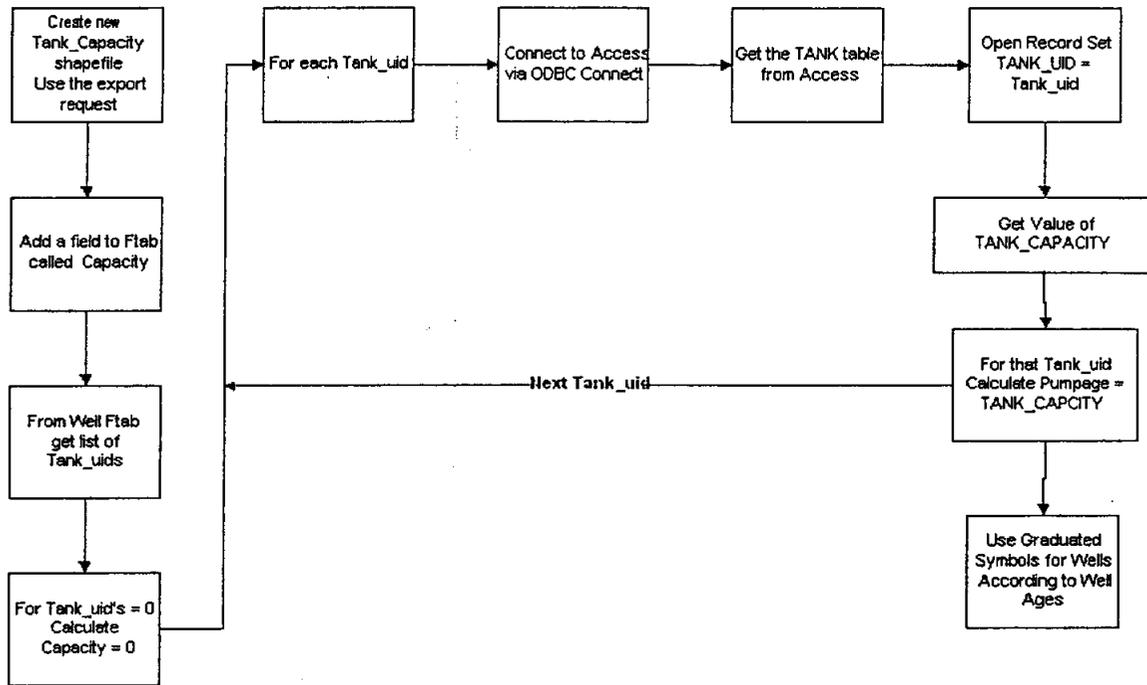


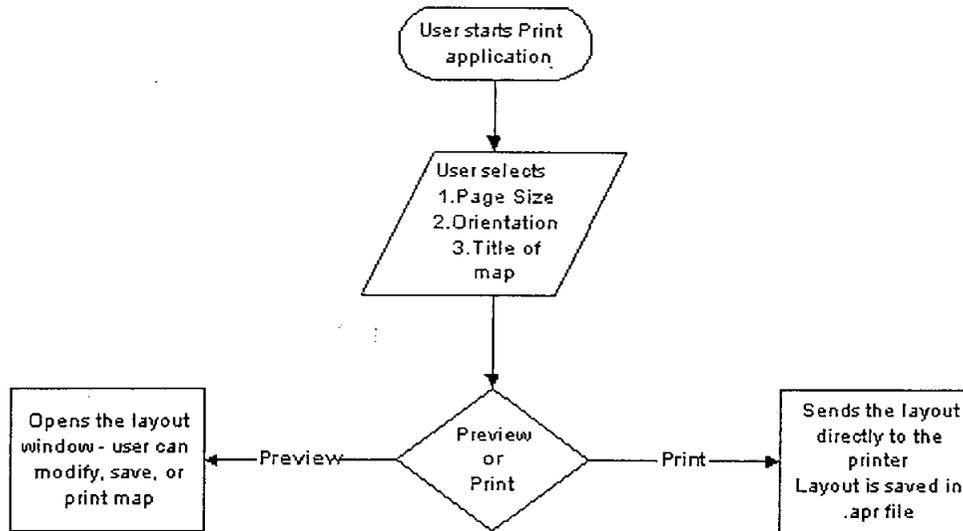
Exhibit IV-17 Well Pumpage Query Work Flow Diagram



**Exhibit IV-18
Tank Capacity Query
Work Flow Diagram**



**Exhibit IV-19
Print Application
Work Flow Diagram**



V. DATA ISSUES

Associations

An attempt was made to link the spatial data in the GIS with the non-spatial data in the ACCESS database using a QA/QC-application (described later in the Application Documentation section). Discrepancies are listed below:

District

The District coverage contained 150 jurisdiction boundaries. Of those, 148 received their link to the ACCESS database. The two that did not receive a link were:
Hunter's Glen MUD - The Questionnaire was not returned to The Team.
Harris Co. WCID 133 - This district opted out of the NHCRWA

Service area

The Service area coverage contained 53 records. Of those, 52 are linked to the ACCESS database.
Champ's Water Supply, Inc. - This service did not receive a questionnaire

Well

The Well coverage contained 257 records. Of those, 246 are linked to the ACCESS database. The remaining 105 wells have not received a link because their questionnaires have not been returned.

Tank

The Tank coverage contains 184 records, all of which linked to the ACCESS database.

System Interconnect

The System Interconnect coverage contains 135 records, all of which linked to the ACCESS database.

Wastewater Treatment Plant

The Wastewater Treatment Plant coverage contains 60 records, all of which linked to the ACCESS database.

Duplications

In addition to the linking issues listed above, there were some duplicated graphics produced during the data entry process. Below is a list of the duplicated graphics with a short description of the reason for the duplication.

CY-CHAMP

HARRIS CO. MUD 191 – System Interconnects have different latitude and longitudes

CYPRESS CREEK UD

NW HARRIS CO. MUD 9 - System Interconnects (graphics) were established by map markup

HARRIS CO. MUD 25

W HARRIS CO. MUD 1 - System Interconnects have different latitude and longitudes

W HARRIS CO. MUD 1

HARRIS CO. MUD 25 - System Interconnects have different latitude and longitudes

HARRIS CO. MUD 354

HARRIS CO. MUD 322 - System Interconnects have different latitude and longitudes

HARRIS CO. MUD 358

HARRIS CO. MUD 322 - System Interconnects have different latitude and longitudes

HARRIS CO. MUD 43

HARRIS CO. WCID 136 - One System Interconnect in questionnaire, but several established by map markup. The map markup took priority in this case.

HARRIS CO. WCID 136

HARRIS CO. MUD 43 - One System Interconnect in questionnaire, but several established by map markup. The map markup took priority in this case.

HARRIS CO. WCID 91

PONDEROSA FOREST UD - System Interconnects (graphics) were established by map markup

PONDEROSA FOREST UD

HARRIS CO. WCID 91 - System Interconnects have different latitude and longitudes

NW HARRIS CO. MUD 9

MILLS ROAD MUD - System Interconnects (graphics) were established by map markup

LOUETTA ROAD UD

TERRANOVA WEST MUD - System Interconnects (graphics) were established by map markup

TERRANOVA WEST MUD

LOUETTA ROAD UD - System Interconnects (graphics) were established by map markup

North Harris County Regional Water Authority Geographic Information System

VI. SUMMARY OF WORK

Summary

This Geographic Information System provided to the NHCRWA by Cobourn Linseisen and Ratcliff, Inc. was designed to acquire and disseminate data. The data is needed to meet the requirements of the HGCSO's 1999 Regulatory Plan for phased conversion from currently 100% groundwater consumption to 20% groundwater and 80% surface water by year 2030. In addition, by examining the existing mapped layout of the NHCRWA, the construction of connections between the individual districts or service areas can be planned and implemented as needed. Therefore, the GIS provides for the immediate needs of the NHCRWA and can be continually updated for future developments.

As described in this Project Report, meticulous steps were followed to insure the integrity of the project. Every reasonable effort was taken to insure a high level of response and accuracy throughout the project. Districts not responding initially, were phoned, faxed, or contacted by NHCRWA to provide CLR with needed data.

Disclaimer Notice

The GIS services performed by CLR, Inc. for the NHCRWA have been produced from various outside sources. Every effort has been made to ensure the accuracy of the spatial and non-spatial data associated with it. However, CLR, Inc. does not guarantee its accuracy or completeness and assumes no liability for damages due to errors or omissions. Field verification should be done as necessary.

Appendix A

Introduction

The appendix contains the information provided to CLR, Inc. from TNRCC and HGCSD. This purpose of this information was to assist in the development of the NHCRWA's GIS and is included in this manual as backup documentation. For this reason, the format and content has not been altered by CLR. Since the format has not been altered, appendices references in "Appendix A" of the project manual **do not** correspond with the Appendices in this manual.

Data Dictionary for the Conservation & Reclamation District (District) Regions Coverage

Coverage last updated - 08/03/00

Next scheduled update - 09/01/00

Conservation & Reclamation Districts Attribute Table Location

Info Table Name*	district.patdistrict district.dbf (Shape file)**
Table Path	s:\wu\da\
Data Dictionary Name	districts.dic
Data Dictionary Path	s:\wu\da\
Staff	Suzanne Jaster, Staff Cartographer Michael Cruz, Intern Utility Certification & District Creation Team Water Permits & Resource Management Division TNRCC

* The Info table is the Arc/Info table for the coverage. It is a regions coverage, so the table is specified as region.districtid.

** The coverage is in shape file format in order to save space on the s: drive and also because it is faster to load into ArcView over the network.

Disclaimer Notice

The Texas Natural Resource Conservation Commission (TNRCC), Water Permits & Resource Management Division, makes no claims as to the accuracy or completeness of the data contained in the *CONSERVATION AND RECLAMATION DISTRICT GIS COVERAGE*. This data file is currently undergoing quality assurance for completeness and accuracy. *Users outside of the Utilities & Districts Section assume all liability for omissions and inaccuracies.*

Information on a given District is only as current as the most recent information provided by the District to TNRCC.

A complete description of each field is contained within this document.

District Coverage Description and Contact Information

This document describes the fields found in the *TNRCC CONSERVATION AND RECLAMATION DISTRICTS (Water Districts) regions coverage attribute table*. Field descriptions are listed alphabetically by field name. The Districts coverage is maintained by the Utility Certification & District Creation Team. The Districts coverage is maintained using ESRI software, ArcView and Arc/Info, at the central office in Austin. Corrections, questions, additions, and comments should be directed to the Staff Cartographer, Suzanne Jaster, at (512) 239-6950, or "sjaster@tnrcc.state.tx.us".

Utilities & Districts Section staff may gain access to the coverage and table in s:\wu\da directory. The coverage is maintained on a daily basis, however, the coverage listed in the above directory is updated on a monthly basis.

Non-agency individuals interested in this data should make all requests to Suzanne Jaster, at (512) 239-6950.

Once this data has been TNRCC "Certified", this data will available to the general public in export (e00) format. At that time customers wishing to obtain a copy of the coverage should contact Barry Allison, GIS Services, Information Resources Division, at (512) 239-0870 or (512) 239-0850.

The TNRCC has "continuing right of supervision" over water districts in accordance with the Texas Water Code. As part of the regulatory effort, the Districts layer has been developed to provide information on the location, size and areas of the districts.

Suzanne Jaster
Staff Cartographer
x6950

Utilities & Districts Section
Water Permits & Resource management Division
Texas Natural Resource Conservation Commission

District Coverage Project Description and Status

Through contracts with Southwest Texas State University (SWT), the District Applications Team has converted District boundary maps to electronic format for use in a Geographic Information system (GIS).

To date, there have been two contracts with SWT:

Phase 1 506 districts are converted by input of metes and bounds into an Arc/Info coverage. Contract substantially completed in August 1996.

Phase 11299 districts are converted into an Arc/Info coverage. Districts in this phase were converted by either input of metes & bounds, digitizing, or using electronic data submitted by the districts on diskette. Contract completed in August 1998.

In July 1999, all 805 completed districts were combined into one coverage, the current attribute table was developed, and QAQC was started. All delivered districts had to be verified for accuracy and updated if changes had been made since the start of the project.

Current project status:

Total Districts list in Districts Database: 1327

Total Districts in Districts Coverage: 729 Missing: 598

QAQC'd Districts: 490

Districts needing to be checked: 239

The next step of the project will include a mail out to all Districts for which no boundary information exists.

Structure of District.Patdistrict (District.dbf)
The order as will appear on table from left to right.

Field Name	Field Description (type output width, decimals)	Sequence
AREA	F 18, 5 *	1
PERIMETER	F 18, 5 *	9
DISTRICT#	B 5	17
DISTRICT-ID	B 5	21
NAME	C 60	25
COUNTY	C 15	85
COGO_ACRES	F 16, 4	100
PLAT_ACRES	F 16, 4	108
GAP	F 8, 2	116
DIGITIZED (Temporary Field)	C 3	124
DISTRICT	C 7	127
TYPE	C 8	134
TRACT (Temporary Field)	C 12	142
STATUS	C 3	154
TX_CNTY	C 3	157
FIPS	C 3	160
INITIALS	C 3	163
CREATIONDATE	D 10	166
BNDRYCHANGE	D 10	174
COMMENTS	C 35	182
B_SOURCE	C 6	217
V_SOURCE (Temporary Field)	C 6	223
ACCURACY	C 3	229
DB_ACRES (Temporary Field)	F 16, 4	232
PRECISION	F 10, 6	240
RMS	F 8, 3	248
UPDATED	D 10	256

Field Types

F = Decimal numbers stored in internal Floating point representation

D = Date YYYYMMDD

B = Whole numbers stored as Binary integers

I = Integer stored as 1 byte per digit

C = Charakter

***Layer is Double precision**

Field Descriptions
Alphabetical Order

ACCURACY

This character field indicates the accuracy status of the District boundary. The District boundary must meet all the Accuracy Requirements for the B_Source category in order to Pass. This field is also used to help QA/QC the district data that was completed by SWT.

Format:

P = Pass The district boundary passes all accuracy requirements depending on whether the district was created by Metes & Bounds, digitized or on another data set. Acceptable datasets are TIGER county lines and USGS Basins.

NP = Not Pass The boundary does not pass all accuracy requirements. The district should be contacted.

Field Sequence	229
Arc/Info Field Name	ACCURACY
.DBF Field Name	ACCURACY
Field Type, Length	Character, 3

Accuracy Requirement for B_Source by Category:

1. Metes & Bounds/Electronic File
 - a. COGO Acres are within .05 of Plat acres
 - b. Precision (Gap/Perimeter) is less than 0.0001.
 - c. Boundary shape matches map.
 - d. Boundary location has been checked against TXDOT coverage.
2. Digitized
 - a. Digitized acres are within .05 of Plat acres.
 - b. _____RMS error < .003.
 - c. Boundary shape matches map
 - d. Boundary location has been checked against TXDOT coverage.
3. Dataset
 - a. District boundary is based on TIGER county lines only or USGS Basins
 - b. Polygon acres are within .XX of plat acres.
 - c. Boundary location has been checked against TXDOT coverage.
1. All
 - a. DB_Acres and Plat_Acres must match. This is a check to make sure the Database and coverage have the most current information and the same information.

AREA

This eighteen-digit decimal number field contains the total size of the District polygon(s) in square meters. This is updated and generated when the coverage is updated using Arc/Info. This measurement is computer generated and may not reflect the number entered in PLAT_ACRES or COGO-ACRES. This number is in meters because the units of the coverage projection (TSMS) are in meters

Field Sequence	1
Arc/Info Field Name	AREA
.DBF Shape File Field Name	AREA
Field Type, Length, Points	Decimal, 18, 5

Note:

TSMS - Texas State Mapping System projection as defined in the Texas GIS Planning Council's GIS Data Standards:

Map Projection Name: Lambert Conformal Conic

Standard Parallel: 34d 55m 00s

Standard Parallel: 27d 25m 00s

Longitude of Central Meridian: -100d 00m 00s

Latitude of Projection Origin: 31d 10m 00s

False Easting: 1,000,000 meters

False Northing: 1,000,000 meters

TSMS is in meters.

Geodetic Model:

Horizontal Datum Name: North American Datum 1983

Ellipsoid Name: Geodetic Reference System 80

B_SOURCE

B_Source stands for Boundary Source. This is an alpha-numeric field containing codes that show the source of the District geographic information.

Category	Field Format	Description
<u>Digitized</u>	D	Digitized using TxDOT County Road basemaps or USGS basemaps

<u>Metes & Bounds</u> MAPMB	Metes and Bounds (from hard copy Map)
MBFN	Metes and Bounds from Field Notes

Electronic File

File supplied by District, must be based on Metes & Bounds, following are acceptable formats:

DWG	AutoCAD File
DGN	Microstation File
SHP	ArcView Shape File
COV	Arc/Info Coverage

Dataset

District was built using another GIS dataset, following are acceptable datasets:

CNTY	District boundary based on county lines. Based on 1990 TIGER County lines, 1:100k
BASIN	District boundary based on USGS 1:500K dataset
OTHER	District boundary based on the above combined datasets. May have digitized areas in it.

Field Sequence	217
Arc/Info Field Name	B_SOURCE
.DBF Shape File Field Name	B_SOURCE
Field Type, Length	Character, 6

Note:

This field is an expanded version of the field labeled DIGITIZED which was setup by SWT. If a District had been digitized it was entered as Y, otherwise it was N.

BNDRYCHANGE

This date field shows the date the District boundary was modified. This the date the District board members voted for the change.

Format:

YYYYMMDD

Field Sequence	174
Arc/Info Field Name	BNDRYCHANGE
.DBF Field Name	BNDRYCHANGE
Field Type, length, format	Date, 10, YYYYMMDD

COGO_ACRES

This numeric field shows the total District acreage as computed by a COGO application.

Field Sequence	100
Arc/Info Field Name	COGO_ACRES
.DBF Shape File Field Name	COGO_ACRES
Field Type, Length, Points	Decimal, 16, 4

Applications used for computing acreage:

AutoCAD***
MapDraw
ArcView

*** Due to differences in the way applications round numbers and handle precision, etc. the preferred application for establishing COGO acreage is AutoCAD.

COMMENTS

This field provides space to clarify the status of the district boundary or list special notes of information.

Field Sequence	182
Arc/Info Field Name	COMMENTS
.DBF Field Name	COMMENTS
Field Type, Length	Character, 35

Note:

For comments containing SN (See Note) additional information about the district boundary can be found in the WordPerfect document s:\wu\da\temp\districts_works\districts_log.wpd.

COUNTY

This field provides the name of the county name that contains the District. If the District overlaps more than one county, the county name is listed for the Main County. The Main County is that county in which the main offices of a district are located.

Field Sequence	85
Arc/Info Field Name	COUNTY
.DBF Field Name	COUNTY
Field Type, Length,	Character, 15

CREATIONDATE

This date field shows the date the District was created.

Format:

YYYYMMDD

Field Sequence	166
Arc/Info Field Name	CREATIONDATE
.DBF Field Name	CREATIONDATE
Field Type, length, format	Date, 10, YYYYMMDD

DB_ACRES (Temporary field)

This numeric field contains the acreage as listed in the Districts database. The value in this field should match acreage listed on the existing most recent plat provided by the District. The value should also be found in the most recent field notes.

This field is intended as a check to make sure the Districts database and GIS coverage are on par with each other. It is also a way to QAQC the Districts that were done by SWT. Once all the SWT delivered districts have been checked, verified or updated, this field will be eliminated.

Field Sequence	232
Arc/Info Field Name	DB_ACRES
.DBF Shape File Field Name	DB_ACRES
Field Type, Length, Points	Decimal 16, 4

DIGITIZED (Temporary field)

This field is information that was supplied with the SWT deliverables. This field contains information on whether the District was digitized from a hard-copy map or entered in by Metes & Bounds.

Once all the SWT delivered districts have been checked, verified or updated. This field will be eliminated. The information will be replaced by that contained in the B_SOURCE field.

Format:

Y - Districts was digitized

N - District was created using Metes & Bounds or digital file supplied by the District.

Field Sequence	124
Arc/Info Field Name	DIGITIZED
.DBF Shape File Field Name	DIGITIZED
Field Type, Length	Character, 3

DISTRICT

This numeric field contains a unique number assigned to each District, a.k.a Alpha Number. This number is assigned by the Utility Certification & District Creation Team.

**** This field must be filled in. The District can not exist without a District ID.

Field Sequence	127
Arc/Info Field Name	DISTRICT
.DBF Shape File Field Name	DISTRICT
Field Type, Length	Integer, 7

DISTRICT-ID

This numeric field contains a unique number assigned by Arc/Info to each District when the coverage was last updated. This is an integral part of the Arc/Info coverage.

Field Sequence	21
Arc/Info Field Name	DISTRICT-ID
.DBF Shape File Field Name	DISTRICT_ID
Field Type, Length	Integer, 5

DISTRICT#

This numeric field contains a unique number assigned by Arc/Info to each District when the coverage was last updated. This is an integral part of the Arc/Info coverage.

Field Sequence	17
Arc/Info Field Name	DISTRICT#
.DBF Shape File Field Name	DISTRICT#
Field Type, Length, Points	Integer, 5

FIPS

This alphanumeric field contains the three-digit Federal Information Processing System (FIPS) county code of the county in which the DISTRICT is located. If the District overlaps more than one county, then the county FIPS code is listed for the Main County. The Main County is that county in which the main offices of a district are located.

Format:

- FIPS code (TX_CNTY# x 2) - 1 = FIPS

Field Sequence	160
Arc/Info Field Name	FIPS
.DBF Shape File Field Name	FIPS
Field Type, Length	Character, 3

GAP

This numerical field contains the size of the Gap which occurs if the polygon did not completely close when it was drawn using a COGO application.

In order for the boundary to meet acceptable accuracy standards the precision (Gap/Perimeter) must be less than 0.0001.

Field Sequence	116
Arc/Info Field Name	GAP
.DBF Field Name	GAP
Field Type, Length	Decimal, 8, 2

INITIALS

This field contains the initials of the person who checked, added, or updated the boundary of the District in the GIS. The initials will represent the person who last updated or entered in District.

Person(s) with access to modify the Districts GIS coverage:

sj - Suzanne Jaster, Utilities & Districts Section Cartographer

ra - Robin Adorno, Public Drinking Water, Systems Analyst

sb - Stacy Burnet, Utilities & Districts Section, Intern,

mc- Michael Cruz, Utilities & Districts Section, Intern

rj - Rachel Johnson, Utilities & Districts Section, Intern

mh - Mike Howell, Assistant Engineer, II

TWDB - Texas Water Development Board supplied the District boundary info.

Field Sequence	163
Arc/Info Field Name	INITIALS
.DBF Shape File Field Name	INITIALS
Field Type, Length	Character, 3

NAME

This field contains the name of the DISTRICT. The name will normally include a District type, i.e. MUD. The name matches the District name as listed in the District Database with the same abbreviations.

Field Sequence	25
Arc/Info Field Name	NAME
.DBF Field Name	NAME
Field Type, Length	Character, 60

Note:

The district type mentioned in the name will not always match the district type in the TYPE field.

PERIMETER

This decimal number field contains the perimeter total of all the District tracts in meters. This number is in meters because the units of the coverage projection (TSMS) are in meters.

Field Sequence	9
Arc/Info Field Name	PERIMETER
.DBF Field Name	PERIMETER
Field Type, Length, points	Decimal Number, 18, 5

Note:

TSMS - Texas State Mapping System projection.

PLAT_ACRES

This numerical field shows the total acreage of the District as shown on the Plat or as listed in the Metes & Bounds. This field should match the acreage in the Districts database. Plat_Acres and Cogo_Acres should be within .05 of each other.

Field Sequence	108
Arc/Info Field Name	PLAT_ACRES
.DBF Field Name	PLAT_ACRES
Field Type, Length, Points	Character, 16, 4-decimal points

PRECISION

This decimal number goes six decimal places. It shows the precision of a boundary based on Gap/Precision. Acceptable precision is > 0.0001 .

Two types of precision:

Boundaries created by Metes & Bounds - Gap/Perimeter should be > 0.0001
RMS Error for digitized boundaries - should be > 0.003 (See RMS field)

Field Sequence	240
Arc/Info Field Name	PRECISION
.DBF Field Name	PRECISION
Field Type, Length, Points	Decimal, 10, 6 decimal points

RMS

This decimal number goes three decimal places. It shows the RMS (Root Mean Square) error of the boundary if it was digitized. Acceptable RMS is > 0.003 .

Two types of precision:

Boundaries created by Metes & Bounds - Gap/Perimeter should be > 0.0001 (See the PRECISION field).
RMS Error for digitized boundaries - should be > 0.003 .

Field Sequence	248
Arc/Info Field Name	RMS
.DBF Field Name	RMS
Field Type, Length, Points	Decimal, 8, 3 decimal points

STATUS

This alphanumeric field shows the status of the District. Active status means the District is levying a tax or selling bonds.

Format:

A - Active

I - Inactive (Financially Dormant)

D - Dissolved, District no longer exists. Boundary to be removed from District coverage.

Field Sequence	154
Arc/Info Field Name	STATUS
.DBF Field Name	STATUS
Field Type, Length	Character, 3

TRACT (Temporary field)

This alphanumeric field contains information regarding different tracts within a District. This field will be taken out once all polygons (tracts) for Districts have been combined to reflect one record. This field was established to manage the different polygons for each District.

The district boundary reflects the entire boundary. Individual tract information within a boundary are located within hardcopy district boundary files.

Format:

Ext - Exception Tract

Tract# - Tract Number

Field Sequence	142
Arc/Info Field Name	TRACT
.DBF Field Name	TRACT
Field Type, Length	Character, 12

TX_CNTY

This alphanumeric field contains the Texas county code as assigned by the Texas Department of Transportation (TXDOT) of the DISTRICT. If the District overlaps more than one county, then the county TX_CNTY code is listed for the Main County. The Main County is that county in which the main offices of a district are located.

Format:

- TX_CNTY code

Field Sequence	157
Arc/Info Field Name	TX_CNTY
.DBF Field Name	TX_CNTY
Field Type, Length	Character, 3

TYPE

This field indicates the type of District as defined by TNRCC.

Selections:

- DD** - **Drainage District**
- FWSD** - **Fresh Water Supply District**
- GCD** - **Groundwater Conservation District**
- ID** - **Irrigation District**
- LID** - **Levee Improvement District**
- MMD** - **Municipal Management District**
- MUD** - **Municipal Utility District**
- ND** - **Navigation District**
- OTH** - **Other**
- RA** - **River Authority**
- RD** - **Regional District**
- SCD** - **Storm Water Control District**
- SUD** - **Special Utility District**
- SWCD** - **Soil & Water Conservation District**
- WCID** - **Water Control & Improvement District**
- WID** - **Water Improvement District**

Field Sequence	134
Arc/Info Field Name	TYPE
.DBF Field Name	TYPE
Field Type, Length	Character, 8

Note:

The above list of acronyms show the "Type" of district; however, there are some additional acronyms or abbreviations that are used which do not necessarily refer to the type, but are used in the name, such as:

- PUD - Public Utility District
- UD - Utility District

UPDATED

This date field represents the date the District was added or last modified in the GIS layer.

Field Sequence	255
Arc/Info Field Name	UPDATED
.DBF Shape File Field Name	UPDATE
Field Type, Length	Date, 10

V_SOURCE (Temporary Field)

V_Source stands for verification source. This is a 16-digit character field containing information on the source that was used to verify the accuracy of the district boundary delivered from SWT. This field is intended to assist in keeping track of which SWT boundaries were checked and the source by which they were checked.

Once all the SWT delivered districts have been checked, verified or updated. This field will be eliminated. The information will be replaced by the B_SOURCE field.

Format:

MAPMB = Hard copy map with Metes and Bounds
MAP = Hardcopy map with no Metes and Bounds
FN = Field Notes (Metes and Bounds in written form.)
DWG = AutoCAD File
DGN = Microstation File
SHP = ArcView Shape File
COV = Arc/Info Coverage
OTH = Other

Field Sequence	223
Arc/Info Field Name	V_SOURCE
.DBF Shape File Field Name	V_SOURCE
Field Type, Length	Character, 6

**DATA DICTIONARY
FOR THE
CERTIFICATE OF CONVENIENCE & NECESSITY (CCN) POLYGON COVERAGE**

Coverage last updated - 12/20/99
Next scheduled update - 01/20/99

CERTIFICATE OF CONVENIENCE & NECESSITY ATTRIBUTE TABLE

Water Permits & Resource Management Division
Utilities & Districts Section
Texas Natural Resource Conservation Commission

Utility Certification & District Creation Team
August 15, 2001

Info Table Name*	CCN.patccn
Table Path	s:\wu\urs\
Data Dictionary Name	ccn_dic.wpd
Data Dictionary Path	s:\wu\urs\
Staff	Suzanne Jaster, Cartographer Christy-Ann Neal, Intern Utility Certification & District Creation Team Water Permits & Resource Management Division TNRCC

* The Info table is the Arc/Info table for the coverage. It is a regions coverage, so the table is specified in regions.ccn.

Disclaimer Notice

The Texas Natural Resource Conservation Commission (TNRCC), Water Permits & Resource Management Division, makes no claims as to the accuracy or completeness of the data contained in the *CERTIFICATE OF CONVENIENCE & NECESSITY (CCN) COVERAGE*. This data file is currently undergoing quality assurance for completeness and accuracy. *Users outside of the Utilities & Districts Section assume all liability for omissions and inaccuracies.*

Information on a given CCN is only as current as the most recently approved application.

A complete description of each field is contained within this document.

Suzanne Jaster
Cartographer
x6950

Utilities & Districts Section
Water Permits & Resource management Division
Texas Natural Resource Conservation Commission

**DATA DICTIONARY
FOR THE CCN COVERAGE ATTRIBUTE TABLE**

Water Permits & Resource Management Division
Utilities & Districts Section
Texas Natural Resource Conservation Commission

This document describes the fields found in the TNRCC *CERTIFICATE OF CONVENIENCE & NECESSITY coverage regions attribute table*. Field descriptions are listed alphabetically by field name. The CCN coverage is maintained by the Utility Certification & District Creation Team. The CCN coverage is maintained using ESRI software, ArcView and Arc/Info, at the central office in Austin. . Corrections, questions, additions, and comments should be directed to the CCN Mapping Manager, Suzanne Jaster, at (512) 239-6950, or "sjaster@tnrcc.state.tx.us".

Water Utilities staff may gain access to the coverage and table in s:\wu\urs directory. The coverage is maintained on a daily basis, however, the coverage listed in the above directory is updated on a monthly basis.

Non-agency individuals interested in this data should make all requests to Suzanne Jaster, at (512) 239-6950.

This data will soon be available to the general public in an Arc/Info coverage. Customers wishing to obtain a copy of the coverage should contact Barry Allison, GIS Services, Information Resources Division, at (512) 239-0870 or (512) 239-0850.

The CCN coverage contains the locations and areas of both water and sewer systems.

STRUCTURE OF CCN.PATCCN (CCN.DBF)

<u>Field Name</u>	<u>Field Type</u>
AREA	F14 3
PERIMETER	F14 3
CCN#	B5
CCN-ID <i>— ArcInfo created</i>	B5
LAYER	I3
CCN	C5
UTILITY	C30
TX_CNTY	C3
FIPS <i>— of one in Texas</i>	C3
UPDATED	D10
MYLAR	C1
APPROVED	C3
REG_NO	C7
MAP_ID	C12

Ignore

→ see page A2-10

Field Types

F = Decimal numbers stored in internal Floating point representation

D = Date yyyyymmdd

B = Whole numbers stored as Binary integers

I = Integer stored as 1 byte per digit

C = Charter

Alphabetical Listing of Fields

APPROVED

This three-character alphanumeric field contains the initials for the person who approved the final version of the CCN after transferring it from the mylar map. Once the transfer of all CCNs has been completed, the initials will represent the person who last updated the CCN. The date of last update is represented in the UPDATE field. The CCN is the best representation of the official version represented on the TXDOT mylar map.

Persons qualified to approved transfered CCNs:

sj - Suzanne Jaster, Utilities & Districts Section Cartographer

Field Sequence	70
Arc/Info Field Name	APPROVED
.DBF Shape File Field Name	APPROVED
Field Type, Length	Character, 3

AREA

This fourteen-digit decimal number field contains the size of the polygon in square meters.

Field Sequence	1
Arc/Info Field Name	AREA
.DBF Shape File Field Name	AREA
Field Type, Length, Points	Decimal, 14, 3-decimal points

CCN

This five-character field is the unique identifier assigned to the CCN by the Utilities & Districts Section.

Number begins with:

- 1 Water CCN
- 2 Sewer CCN

Field Sequence	20
Arc/Info Field Name	CCN
.DBF Shape File Field Name	CCN
Field Type, Length	Character, 5

Definitions:

Water CCN -

Sewer CCN -

CCN#

This five-digit numerical field contains a unique number assigned by Arc/Info to each CCN when the coverage was last updated.

Field Sequence	9
Arc/Info Field Name	CCN#
.DBF Shape File Field Name	CCN#
Field Type, Length	Integer, 5

CCN_ID

This five-digit numerical field contains a unique number assigned by Arc/Info to each CCN when the coverage was last built.

Field Sequence	13
Arc/Info Field Name	CCN_ID
.DBF Shape File Field Name	CCN_ID
Field Type, Length, Points	Integer, 5

FIPS

This three-character alphanumeric field contains the three-digit Federal Information Processing System (FIPS) county code where the CCN is completely contained. If the CCN crosses county lines, than an M is used to indicated multiple counties. Counties can be obtained by linking to the database or doing a spatial query.

Selections:

- FIPS code

M - Multiple counties

Field Sequence	58
Arc/Info Field Name	FIPS
.DBF Shape File Field Name	FIPS
Field Type, Length	Character, 3

LAYER (aka CCN Type)

This field indicates whether the CCN is a water system or a sewer system.

Selections:

- 1 Water System
- 2 Sewer System

Field Sequence	17
INFO file Name	LAYER
.DBF Field Name	LAYER
Field Type, Length	Integer, 3

MAP_ID

This 12-character alphanumeric field contains the mylar map number from which the CCN was digitized.

WRS-### The mylar map # that the CCN was taken from. If the CCN crosses county lines then the mylar map for the county in which the CCN sit mostly is listed.

Blank Field This indicates the CCN was created after the mylar was retired.

Field Sequence	80
Paradox Field Name	MAP_ID
.DBF Field Name	MAP_ID
Field Type, Length	Character, 12

MYLAR

This two-character alphanumeric field contains the code for the status of the mylar map from which the CCN was digitized.

- A = Mylar map is still active. The map should be referred to for correct data.
- R = Mylar map has been retired. The CCN on the coverage is the most up-to-date information.

Field Sequence	80
Paradox Field Name	MAP_ID
.DBF Field Name	MAP_ID
Field Type, Length	Character, 12

PERIMETER

This fourteen-digit decimal number field contains the perimeter total of the CCN in meters.

Field Sequence	5
Paradox Field Name	PERIMETER
.DBF Field Name	PERIMETER
Field Type, Length, points	Decimal Number, 14, 3

REG_NO

This 7-character alphanumeric field indicates

????????????????????????????????

Field Sequence	73
Paradox Field Name	REG_NO
.DBF Field Name	REG_NO
Field Type, Length,	Character, 7

TX_CNTY

This three-character alphanumeric field contains the Texas county code as assigned by the Texas Department of Transportation (TXDOT).

Field Sequence	55
Paradox Field Name	TX_CNTY
.DBF Field Name	TX_CNTY
Field Type, Length	Character, 3

UPDATED

This date field indicates the most recent date that CCN was changed for any field within each record.

Field Sequence	61
Paradox Field Name	UPDATED
.DBF Field Name	UPDATED
Field Type, length, format	Date, 10, ddmmyyyy

UTILITY

This 30-character alphanumeric field contains the name of the utility that owns the CCN.

Field Sequence	25
Paradox Field Name	UTILITY
.DBF Field Name	UTILITY
Field Type, Length	Character, 30

HGCSD99.DBF – Database Field Descriptions (updated 4/4/2000)

WELL	HGCSD 4 digit well #
OWNER	Permittee's name & address info
ATTN	
CORR	
ADDRESS	
CITY	
STATE	
ZIP	
ZIPEX	
PHONE	
LATD, LATM, LATS	Latitude in Degrees, Minutes, & Seconds
LOND, LONM, LONS	Longitude in Degrees, Minutes, & Seconds
STBLK, STQUAD, STNI	USGS Quadrangle numbering (Block, Quadrant, & ninth)
NHCRWA	Y or N whether they are in the NHCRWA's jurisdiction.
REG99	HGCSD Regulatory Area #
WATDIST	sub category of Public Supply use (C – city, U – utility district, S – school, B – business, G – government, etc.)
TOTD	Total depth of well
DTFS	Depth to first Screen of well
ELEV	Estimated land surface elevation at the time the well was first permitted
USE	Type of use of the water from the well (P – public supply, I – industrial, A – agricultural irrigation, O – other irrigation)
YRDRL	Year well was drilled
DIAM	Surface casing diameter of the well
PUMP1976-PUMP1999	Calendar year pumpage for the well

NORTH HARRIS COUNTY REGIONAL WATER AUTHORITY

GIS Data Collection Questionnaire

Public/Private Water Supply System

District/Service Area Name: _____

QUESTIONNAIRE INSTRUCTIONS

Format of Questionnaire

This Questionnaire is being sent to public water utility districts, private water supply service areas, and private well owners that have wells pumping five (5) million gallons or more of water per year. The questionnaire is divided into two parts.

Sections 1 through 6 contain questions related to properties/information about the district/service area/private entity (indicated by the entity name in the top right hand corner of each appropriate page).

Sections 7A and 7B contain questions related to the well(s) owned and operated by the district/service area/private entity. For each well shown in our records for the entity of interest, a copy of Sections 7A and 7B are provided (each labeled in the upper right hand corner with the appropriate well number). If a change in the well status has occurred, such as no longer in operation, not owned by the entity, etc., please indicate on well forms.

For reference, abbreviations used in the questionnaire are as follows:

Mgal/yr	Millions of gallons per year	Mgal/day	Millions of gallons per day
gal/mo	Gallons per month	ft	Feet
gal/day	Gallons per day	in	Inches
gal	Gallons	Lat	Latitude (in degrees, minutes, seconds)
gpm	Gallons per minute	Long	Longitude (in degrees, minutes, seconds)

Contact Information for Questionnaire Clarification

If you have any questions regarding this questionnaire or the attached map relating to how to fill out the data, how to return the questionnaire/documents, or if you need clarification on any questions or instructions, please call Mr. Scott Fair of CLR at (713) 860-8461 or email him at sfair@clri.com.

How to Fill Out Questionnaire

1. It is recommended that the well(s) operator complete these forms, drawing on personal knowledge and information from others (engineer, etc.) to complete all questions.
2. Please return these forms as complete as possible with the most recent data available.
3. Please do not leave any blanks in the forms (this is to avoid confusion of whether the item was accidentally skipped, not available, etc.). Use the following codes in the blanks if no data is provided:
 - ? Unknown - Data is collected but currently unknown at the time (please use sparingly)
 - NA Not Applicable - Data does not apply to your current situation
 - X Not Available - Data is not collected by the entity
4. Available contact data has been entered into the forms. Please verify this data and correct it, if needed. If data is missing in the contact information, please fill data in or use codes shown above.
5. PLEASE PRINT. DO NOT WRITE IN CURSIVE OR USE PERSONAL ABBREVIATIONS.

How to Return the Questionnaire

1. A self-addressed stamp envelope is included in this package for return of the materials requested. Postage has been estimated and any postage due over the amount on the stamp will be billed by the post office to the North Harris County Regional Water Authority.
2. Please make copies of the following documents:
 - a) Monthly Wastewater Treatment Plant Operations Report for each wastewater treatment plant in the district/service area for each month in the year 2000,
 - b) the Driller's Record Sheet for each well,
 - c) the latest text document for chemical and/or VOCs (volatile organic chemicals) for each well, and
 - d) a copy of the district/service area boundary.Include these copies in the return envelope along with the completed questionnaire marked-up map.
3. PLEASE RETURN THE COMPLETED QUESTIONNAIRE, MARKED-UP MAP, AND REQUESTED DOCUMENT COPIES BY DECEMBER 31, 2000.

Map Mark-Up Instructions

See map for instructions.

Project Documentation

Appendix B

NORTH HARRIS COUNTY REGIONAL WATER AUTHORITY

GIS Data Collection Questionnaire

Public/Private Water Supply System

District/Service Area Name: _____

SECTION 1 - Contact Information

Date Form Completed: _____

(PLEASE PRINT WHEN FILLING IN THIS FORM)

Name of person completing the form: _____

Phone: _____

Operator: Name: _____ Attn: _____
Address: _____ City: _____
State: _____ Zip: _____ Phone: _____ Fax: _____
Email: _____

Engineer: Name: _____ Attn: _____
Address: _____ City: _____
State: _____ Zip: _____ Phone: _____ Fax: _____
Email: _____

Attorney: Name: _____ Attn: _____
Address: _____ City: _____
State: _____ Zip: _____ Phone: _____ Fax: _____
Email: _____

Board President: Name: _____
(if public) Address: _____ City: _____
State: _____ Zip: _____ Phone: _____ Fax: _____
Email: _____

District Office: Name: _____ Contact: _____
(if public) Address: _____ City: _____
State: _____ Zip: _____ Phone: _____ Fax: _____
Email: _____

Current Owner: Name: _____
(if private) Address: _____ City: _____
State: _____ Zip: _____ Phone: _____ Fax: _____
Email: _____

NORTH HARRIS COUNTY REGIONAL WATER AUTHORITY

GIS Data Collection Questionnaire

Public/Private Water Supply System

District/Service Area Name: _____

SECTION 2 - Water Connections Associated with Existing and New Development

Through month of _____

	2000	1999	1998
1. Annual Water Usage:	_____ Mgal/yr	_____ Mgal/yr	_____ Mgal/yr
2. Peak Monthly Water Usage:	_____ gal/mo	_____ gal/mo	_____ gal/mo
3. Month of Peak Water Usage:	_____	_____	_____
4. Minimum Monthly Water Usage:	_____ gal/mo	_____ gal/mo	_____ gal/mo
5. Month of Minimum Water Usage:	_____	_____	_____
6. Peak Daily Water Usage:	_____ gal/day	_____ gal/day	_____ gal/day
7. Number of Active Connections:	(Average per Year)		
	_____ residential	_____ residential	_____ residential
	_____ commercial	_____ commercial	_____ commercial
	_____ irrigation	_____ irrigation	_____ irrigation
	_____ industrial	_____ industrial	_____ industrial
8. Active Connections Water Usage:	(Average per Year)		
residential:	_____ Mgal/yr	_____ Mgal/yr	_____ Mgal/yr
commercial:	_____ Mgal/yr	_____ Mgal/yr	_____ Mgal/yr
irrigation:	_____ Mgal/yr	_____ Mgal/yr	_____ Mgal/yr
industrial:	_____ Mgal/yr	_____ Mgal/yr	_____ Mgal/yr
9. Number of External Connections*:	(Average per Year)		
	_____ residential	_____ residential	_____ residential
	_____ commercial	_____ commercial	_____ commercial
	_____ irrigation	_____ irrigation	_____ irrigation
	_____ industrial	_____ industrial	_____ industrial
10. External Connections Water Usage:	(Average per Year)		
residential:	_____ Mgal/yr	_____ Mgal/yr	_____ Mgal/yr
commercial:	_____ Mgal/yr	_____ Mgal/yr	_____ Mgal/yr
irrigation:	_____ Mgal/yr	_____ Mgal/yr	_____ Mgal/yr
industrial:	_____ Mgal/yr	_____ Mgal/yr	_____ Mgal/yr

*External Connections are those in which an entity outside the District/Service Area boundaries is obtaining water from the District/Service Area.

NORTH HARRIS COUNTY REGIONAL WATER AUTHORITY

GIS Data Collection Questionnaire

Public/Private Water Supply System

District/Service Area Name: _____

SECTION 2 - Water Connections Associated with Existing and New Development (cont'd)

	2000-2010	2010-2020	2020-2030	2030-2040	2040-2050	ultimate development
11. Potential New Water Connections: <i>(excluding existing connections)</i>						
residential:	_____	_____	_____	_____	_____	_____
commercial:	_____	_____	_____	_____	_____	_____
irrigation:	_____	_____	_____	_____	_____	_____
industrial:	_____	_____	_____	_____	_____	_____

SECTION 3 - Elevated Storage Tank Data Sheet

Tank name or ID: _____

Tank capacity: _____ gal Overflow elevation in feet relative to ground surface: _____

Bottom of bowl elevation in feet relative to ground surface: _____

Tank manufacturer: _____ Bowl configuration: _____

SECTION 4 - Existing System Interconnects

System Interconnect # 1: Location of interconnect Lat1: _____ Long1: _____

Type of interconnect Emergency Normally Open Size of interconnect: _____ in (if reducer/increaser, give minimum size)

Entities connected Entity: _____ Size of connecting pipe: _____ in

This SE ISg Supplier or Consumer

System Interconnect # 2: Location of interconnect Lat2: _____ Long2: _____

Type of interconnect Emergency Normally Open Size of interconnect: _____ in (if reducer/increaser, give minimum size)

Entities connected Entity: _____ Size of connecting pipe: _____ in

System Interconnect # 3: Location of interconnect Lat3: _____ Long3: _____

Type of interconnect Emergency Normally Open Size of interconnect: _____ in (if reducer/increaser, give minimum size)

Entities connected Entity: _____ Size of connecting pipe: _____ in

System Interconnect # 4: Location of interconnect Lat4: _____ Long4: _____

Type of interconnect Emergency Normally Open Size of interconnect: _____ in (if reducer/increaser, give minimum size)

Entities connected Entity: _____ Size of connecting pipe: _____ in

System Interconnect # 5: Location of interconnect Lat5: _____ Long5: _____

Type of interconnect Emergency Normally Open Size of interconnect: _____ in (if reducer/increaser, give minimum size)

Entities connected Entity: _____ Size of connecting pipe: _____ in

NORTH HARRIS COUNTY REGIONAL WATER AUTHORITY

GIS Data Collection Questionnaire

Public/Private Water Supply System

District/Service Area Name: _____

SECTION 5 - Wastewater Treatment Plant Information

Please make a copy of this blank exhibit and fill out for each wastewater treatment plant the district/service area owns. If the district/service uses another district/service area's wastewater treatment plant, please indicate below (do not fill out the rest of the information).

District/Service Area whose WWTP is used: _____

Name of shared plant: _____

Name of Plant: _____ Texas/TPDES Permit Number: _____

Location: Lat: _____ Long: _____

Actual Annual Average Daily Flow: _____ Mgal/day Avg Daily Flow for Minimum Flow Month: _____ Mgal/day

Has there been any reuse of treated water from this plant in the last three years? Yes No

If yes, please answer the following: Type of treatment: Type I Type II

How much reuse of treated water: Through month of _____ 2000 _____ Mgal/day

For the year of: 1999 _____ Mgal/day

For the year of: 1998 _____ Mgal/day

Would your district be interested in a potential reuse program? Yes No

Please provide a copy of the District/Service Area's Monthly Wastewater Treatment Plant Operations Report for each wastewater treatment plant for the year 2000.

SECTION 6 - Non-Potable Users

USER #1 Name of non-potable user: _____

Address: _____ City: _____ Zip: _____

Phone: _____ Fax: _____ Type of user: Commercial Irrigation

Email: _____ Industrial Institutional

Are you currently using non-potable (reclaimed wastewater)? Yes No If yes, how much: _____ Mgal/day

If yes, would you be willing to use more? Yes No If yes, how much: _____ Mgal/day

If yes, TNRCC 210 authorization? Yes No

If not currently using non-potable water, would you be willing to convert? Yes No If yes, how much: _____ Mgal/day

Are you also currently using well water? Yes No If yes, how much: _____ Mgal/day

Would you be interested in a potential reuse program? Yes No

USER #2 Name of non-potable user: _____

Address: _____ City: _____ Zip: _____

Phone: _____ Fax: _____ Type of user: Commercial Irrigation

Email: _____ Industrial Institutional

Are you currently using non-potable (reclaimed wastewater)? Yes No If yes, how much: _____ Mgal/day

If yes, would you be willing to use more? Yes No If yes, how much: _____ Mgal/day

If yes, TNRCC 210 authorization? Yes No

If not currently using non-potable water, would you be willing to convert? Yes No If yes, how much: _____ Mgal/day

Are you also currently using well water? Yes No If yes, how much: _____ Mgal/day

Would you be interested in a potential reuse program? Yes No

NORTH HARRIS COUNTY REGIONAL WATER AUTHORITY

GIS Data Collection Questionnaire

Public/Private Water Supply System

Well Number: _____

SECTION 7A - Existing Water Well Data Sheet

In addition to the following information, please provide a copy of the driller's record sheet for this well.

Well Address: _____

Does this well service more than one district? Yes No

If Yes, please list districts serviced by this well: _____

Well properties:

Well diameter: _____ in

Well pumping capacity: _____ gpm

Annual pumpage rate: _____ Mgal/yr

Approximate date of well construction _____

Date of most recent groundwater modification of the well: _____ Type of modification

- Lowering of pump
- Replacement of pump production
- Cleaning of screens
- Elimination of any production zone
- Other _____

Total well depth in feet relative to ground surface: _____

Do you think well will need to be replaced in: 2-5 years
 5-10 years
 10+ years

Current submergence of well pump: _____ ft

Does this well produce sand? Yes No

Does this well produce gas? Yes No

Does this well have a known radon or radium problem? Yes No

Any other known problems: _____

What does this well discharge into: Ground storage tank

Elevated storage tank Name or ID of elevated storage tank: _____

System

Other (please describe below) _____

Please provide a copy of the latest test for chemical and/or VOCs (volatile organic chemicals) for this well.

NORTH HARRIS COUNTY REGIONAL WATER AUTHORITY

GIS Data Collection Questionnaire

Public/Private Water Supply System

Well Number: _____

SECTION 7B - Ground Storage Tank Data Sheet

Tank #1:

Tank name or ID: _____

Tank capacity: _____ gal Overflow elevation in feet relative to ground surface: _____

Bottom of tank elevation (bottom elevation of water storage section) in feet relative to ground surface: _____

Tank diameter: _____ ft

Tank #2:

Tank name or ID: _____

Tank capacity: _____ gal Overflow elevation in feet relative to ground surface: _____

Bottom of tank elevation (bottom elevation of water storage section) in feet relative to ground surface: _____

Tank diameter: _____ ft

Tank #3:

Tank name or ID: _____

Tank capacity: _____ gal Overflow elevation in feet relative to ground surface: _____

Bottom of tank elevation (bottom elevation of water storage section) in feet relative to ground surface: _____

Tank diameter: _____ ft

DATA COLLECTION PLAN

The following will establish CLR's steps/procedures in acquiring the data for the NHCRWA.

Primary Data Collection Methods

- Step 1. Receive data from the questionnaire.
 Step 2. If data on questionnaire is missing, call for follow-up.
 If questionnaire is not received within two weeks after send-out date, call for follow-up.
 Step 3. If Step 2 fails, the NHCRWA will need to get involved (additional follow-up call).

Secondary Data Collection Procedures

- Procedure A – HGCSO (Houston Galveston Coastal Subsidence District) permitted information
 Procedure B – If applicable site visit/meeting with the Major Local Operators
 Procedure D – Contact TNRCC (Texas National Resource Conservation Commission)
 Procedure E – Contact water supply system Engineer/Owner
 Procedure F – Contact water well driller or well testing service
 Procedure N – No further action will be taken

Graphic	Attribute	Procedure
Political Subdivision (MUDs) Private Water Supply Systems (CCNs)		
	Operator contact information	D
	Engineer contact information	D
	Attorney contact information	D
	Current board president contact information (if public)	D
	District office contact information (if public)	D
	Current owner contact information (if private)	D
	Peak daily water usage for 1998, 1999, 2000	B
	Number of active water connections for 1998, 1999, 2000 by residential, commercial, irrigation, industrial	B
	Active connections water usage for 1998, 1999, 2000 by residential, commercial, irrigation, industrial	B
Number of External connections for 1998, 1999, 2000	B	

Graphic	Attribute	Procedure	
	External connections water usage for 1998, 1999, 2000	B	
	Total number of potential new connections in ten-year increments from 2010-2050 by residential, commercial, irrigation, industrial	E	
	Non-potable user name	B	
	Non-potable user address information	B	
	Type of non-potable water users usage by residential, commercial, irrigation, industrial	E	
	Amount of reclaimed water used?	E	
	Using well water?	E	
	Amount of well water used?	E	
	Are you interested in a potential reuse program?	E	
	Existing Water Wells		
		Address	A
Diameter		B,E,F	
Pump capacity		B,E,F	
Annual pumpage rate		A	
Approximate date of well construction		B,F	
Date of well modification		E	
Type of well modification		E	
Well depth		B,E,F	
Current submergence of well pump		B,E,F	
Produce gas or sand		B,E,F	
Problems with radium/radon		B,E,F	
Any other known problems		B,E,F	
Copy of latest test for chemicals and/or VOC		B,E	
Drillers record sheet		B,E,F	
Related ground storage tank	B		
Potential to continue current production	E		
Planned/Future Wells			
	Planned water well capacity	E	
	Planned drill date	E	
	Potential related ground storage tank	E	
Ground Storage Tanks			
	Tank name or ID	N	
	Tank capacity	B,E	
	Overflow elevation	B,E	
	Bottom of tank elevation	B,E	
Tank diameter	B,E		
Elevated Storage Tanks			
	Tank name or ID	N	

Graphic	Attribute	Procedure
	Tank capacity	B,E
	Overflow elevation	B,E
	Bottom of bowl elevation	B,E
	Tank manufacturer	E
	Tank bowl configuration	B,E
	Wastewater Treatment Plants	Name of Plant
Permit Number		B,E
Latitude		B,E
Longitude		B,E
Actual annual average flow		B
Avg. daily flow for minimum flow month		B
Any reuse of treated water from plant		E
Interconnects	Latitude	E
	Longitude	E
	Type of interconnection	B
	Size of interconnect	E
	Entities connected (Entity)	B,E
	Entities connected (size of connecting pipe)	B,E

Entity-Relationship Diagram (ERD)

