Texas Water Development Board

BRACS Program Contract Data Requirements

Revision Date: October 22, 2015

1. **Well Control**
   a. All data and information provided to TWDB must be non-confidential.
   b. All well attributes should be added to the BRACS Database.
   c. All well reports, geophysical well logs, and other well information used in a project shall be provided to TWDB.
      i. Digital formats: well reports, PDF; Geophysical well logs, TIFF or LAS (if available).
   d. Data storage folder structure
      i. All well reports and geophysical well logs must be filed using this folder structure.
      ii. Water well and supporting data will be filed in a folder named DrillerWellLogs with subfolders named by state_county codes.
      iii. Geophysical well logs will be filed in a folder named GeophysicalWellLogs with subfolders named by state_county codes.
      iv. State_County code: example 42_029 for Bexar County. TWDB has a Microsoft Excel spreadsheet with the state and county codes.
   e. Digital file names
      i. Q-logs from the Railroad Commission of Texas Groundwater Advisory Unit: Example: Q123_029.tif. If there are multiple logs per well, add log1, log2, … to file name as a suffix. If more than one well is assigned the same Q number, add letters a, b, c, … to Q number, example Q123a_029.tif, Q123b_029.tif.
      ii. All other well control must have the State and County code prefix added to the filename (Example: 42029_123456.pdf.
      iii. The digital file name, file type, and folder name will be recorded in the BRACS Database table tblGeophysicalLog_Header or tblBracsWaterWellReports.

2. **BRACS Database**
   a. All new well control will be added to a copy of the BRACS Database.
   b. New data tied to existing well control in the BRACS Database, such as geology records (lithology; stratigraphic picks; salinity zones) will have applicable tables updated.
   c. Use Brackish Resources Aquifer Characterization System Database Data Dictionary (TWDB Open File Report 12-02, Second Edition, September, 2014) to understand table relationships, field names, and data types.
   d. New well control provided by a contractor will begin with a specified well _id. Coordinate with TWDB BRACS staff for this starting well_id number. As a contractor appends new well control to their copy of the BRACS Database, TWDB staff will continue to update the official BRACS Database. When the project is complete, TWDB staff will take all new project well control records and append them to the official BRACS Database.

3. GIS files

    a. All GIS files will be compatible with ESRI ArcGIS version 10.2.

    b. Map projection.

        Texas State Mapping System, Albers Equal Area. The ESRI projection parameters are:

            Projection: Albers
            False_Easting: 4921250.0
            False_Northing: 19685000.0
            Central_Meridian: -100.0
            Standard_Parallel_1: 27.5
            Standard_Parallel_2: 35.0
            Latitude_Of_Origin: 31.25
            Linear Unit: Foot_US (0.3048006096012192)

            Geographic Coordinate System: GCS_North_American_1983
            Angular Unit: Degree (0.0174532925199433)
            Prime Meridian: Greenwich (0.0)
            Datum: D_North_American_1983
            Spheroid: GRS_1980
            Semimajor Axis: 6378137.0
            Semiminor Axis: 6356752.314140356
            Inverse Flattening: 298.257222101

    c. A project snap grid raster will be developed for each project using the Texas State Mapping System, Albers Equal Area projection. Each GIS raster file developed for a project will be snapped to this grid to ensure every grid cell in all rasters stack on top of each other without any offset. TWDB staff create a snap grid slightly larger than the project area with a random integer cell value.

    d. Standard GIS file naming conventions are essential. Refer to TWDB Report 383 for examples and table tblGisFile_NamingConventions in the BRACS Database for a broad range of codes. TWDB will be provided a list of new codes developed by the contractor.

    e. All GIS files will be summarized in an appendix in the technical report listing file names, type, and folder structure. See TWDB Report 383 for examples.

    f. All GIS files will have descriptive metadata documenting the content, data structure, source(s), date(s), quality and other pertinent characteristics of the data using the Federal Geographic Data Committee (FGDC) metadata editor within ESRI's ArcCatalog.

    g. All GIS file creation techniques will be described either in the technical report appendix for GIS files or in the section on a particular topic, such as net sand.

    h. All well point files will contain field(s) with well identification numbers, such as the BRACS Database well_id, Groundwater Database state_well_number, Submitted Driller's Report track_number, API_number, or TCEQ Public Water Supply water_source code.

    i. All GIS files (and subsequent map figures or tables) depicting groundwater salinity will use the color scheme shown in list item 5.

    j. Use TWDB Groundwater Availability Modeling (GAM) county shapefile for mapping.

    k. Use TWDB 30 meter Digital Elevation Model (DEM) for all elevations of well points and geologic formation surfaces. Should a better quality DEM become available for a project area, consult with TWDB staff and, if approved, provide the DEM to TWDB as a deliverable.

5. **Groundwater salinity classification**

    a. Use classification by Winslow, A.G., and Kister, L.R., 1956, Saline-Water Resources of Texas, U. S. Geological Survey Water Supply Paper 1365, 105 p.

Groundwater salinity classification	Salinity zone code	Total dissolved solids concentration (units: milligrams per liter)
Fresh	FR	0 to 1,000
Slightly saline	SS	1,000 to 3,000
Moderately saline	MS	3,000 to 10,000
Very saline	VS	10,000 to 35,000
Brine	BR	Greater than 35,000

    b. The salinity zone code will be used for GIS file naming.

    c. Technical report figures showing salinity zones or well control showing total dissolved solids concentration will use these colors.

    d. Brackish groundwater is considered slightly and moderately saline (total dissolved solids concentration 1,000 to 10,000 milligrams per liter).

6. **Water quality data**

    a. All water quality data that is not in the TWDB Groundwater Database will be provided to TWDB as a deliverable. Paper documents will be scanned in pdf format and filed in the appropriate state and county folder in the DrillerWellLogs folder. Water quality well control will be added to the BRACS Database, and a digital file name for the pdf well documents will be added to the table tblBracsWaterWellReports.

    b. Water quality data will be evaluated to ensure that samples are accurately assigned to the correct aquifer and/or geologic formation in a systematic and reproducible technique.

    c. Water quality data, if not in the TWDB Groundwater Database, will be appended to tables tblBRACSWaterQuality and tlbBRACSInfrequentConstituents in the BRACS Database.

7. **Geophysical well log data**

    a. All new geophysical well log data used for a project will be provided to TWDB as a deliverable. Paper documents will be scanned in TIFF format and filed in the appropriate state_county code folder in the GeophysicalWellLogs folder. Well control will be added to the BRACS Database, the digital file name and additional attributes will be added to the table tblGeophysicalLog_Header, and log tools will be added to the table tblGeophysicalLog_Suite.

8. **Methodology for interpreting total dissolved solids from geophysical well logs**

    a. The methods (computational, empirical) used to interpret total dissolved solids concentration from geophysical well logs will be fully documented in the technical report. All well records, input and output values, correction factors, and assumptions will be recorded in the BRACS Database. Links to water quality samples for specific depth zones within an aquifer will be provided with the geophysical well log record. If a new technique (or modification of an existing technique) is used, tables will be designed to link to the existing BRACS Database design to store the above mentioned parameters. A data dictionary

description will be provided for the new table design. All geophysical well logs, if not in the BRACS Database, will be provided to TWDB.

b. A number of geophysical well log interpretation techniques are described in:

> Estepp, J.D., 1998, Evaluation of ground-water quality using geophysical logs: Texas Natural Resource Conservation Commission, unpublished report, 516 p.

9. **Geologic formation lithology and stratigraphy**
   a. Geologic formation lithology and stratigraphic top/bottom depth values will be appended to the table tblWell_Geology.
   b. Geologic formation lithology from driller well reports is converted to a simplified lithology using the BRACS Database table tblLkLithologicName_to_SimplifiedLithologicName. This table is updated constantly as new terms are encountered.
   c. Interpretation of sand/clay from geophysical well logs will use a four-tier classification system consisting of the following terms and sand percentages
      i. sand (100 percent sand)
      ii. sand with clay (65 percent sand)
      iii. clay with sand (35 percent sand)
      iv. clay (0 percent sand)

10. **Well identification names and numbers**
    a. New well control added to the BRACS Database will have all well identification names or numbers added to the BRACS Database table tblBRACS_ForeignKey.
    b. The BRACS Database table tblLkFK_ID_Name is a list types of foreign keys. This table is updated constantly as new sources of data are encountered. Consult with TWDB staff if this table needs updating during a project.
    c. Wells used in a project cross section will have a record added to the BRACS Database table tblBRACS_ForeignKey.

11. **Well locations**
    a. Latitude and longitude in decimal degree format will be used for each well.
    b. NAD 83 horizontal datum will be used for each well.
    c. Elevations using 30 meter DEM will be used.
    d. Location attributes will be recorded in the BRACS Database table tblWell_Location.

12. **Technical report**
    a. Times Roman 12 point font.
    b. One inch margins will be used.
    c. Technical report will use the "Formatting Guidelines for Texas Water Development Board Reports" by Mace and others, 2007   http://www.twdb.texas.gov/about/contract_admin/index.asp
    d. No abbreviations will be used in report except BRACS, GIS, or TWDB.
    e. Proper grammar and spelling is required.
    f. References must be listed in separate section of the report and proper citations made within the text.
    g. All GIS files used for figures will be provided as a deliverable.
    h. The TWDB contract number will appear on the cover page.