



FINAL

**Shallow Monitoring Well Installation
Wharton and Matagorda Counties, Texas**

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June 2006

DRAFT
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EXECUTIVE SUMMARY

Four wells were installed to monitor the groundwater elevation at two points near the Colorado River (in the cities of Wharton and Bay City) and at two points in irrigated agricultural areas (near the cities of Eagle Lake and Wadsworth). Total depths of the wells ranged from 47.5 to 70 feet. Boring logs documenting lithology of the penetrated interval were created on the basis of split spoon samples and cuttings from the 11-inch hollow-stem augers used to drill the wells. Wells were completed with 4-inch schedule 40 PVC pipe containing 0.010-inch-wide slots over the screened interval. The wells were registered with the State of Texas and the local Groundwater Conservation District. Automated data loggers were installed in these wells to record changes in water elevation as small as 0.002 foot at 15-minute intervals. Data can be periodically downloaded to a Personal Digital Assistant (PDA) device or laptop computer. Water level data were collected from each well during an equilibration period from April 11 to April 28, 2006. Apparent cable stretch during this initial period ranged from 0.03 to 0.14 foot, and well datums were recalibrated on April 28 to adjust for this change.

Variations in water level in individual wells during this time ranged from 0.4 to 0.7 foot, showing gradual or interrupted increases over the 17-day span. Wells in Wharton and Bay City that are adjacent to the Colorado River had water levels higher than the river over almost the entire period, indicating a groundwater gradient component directed from the well toward the river. River hydrographs show a fluctuation in levels of several feet during the last 6 days of the initial period. Well levels reflected changes in river levels with very little time lag, but well level changes were less than river level changes. Tide-induced river level changes at Bay City were approximately 0.5 foot, whereas tide-induced changes in well levels were approximately 0.02 foot.

Although the data logger memory is sufficient to store about 1,000 days of data, retrievals are scheduled once every three months. The next data collection should occur in early August 2006. The data logger power supply is expected to last for 5 years, which should exceed the study duration. These four new shallow monitoring wells will provide accurate documentation of groundwater/surface water interactions that are critical to evaluations of aquifer recharge, discharge, and withdrawal in the Lower Colorado River Basin.

1.0 INTRODUCTION

The purpose of the Lower Colorado River Authority (LCRA) and San Antonio Water System (SAWS) Water Project (LSWP) is to satisfy long-term water needs in both the Colorado River Basin and the San Antonio area while being a good steward of the environment. Water sources are to include surface water development in off-channel reservoirs and conjunctive use of groundwater for agriculture and agricultural conservation.

This section explains the motivation and major objectives for the Groundwater for Agriculture Study as well as the purpose and objectives of this study as part of the entire LSWP study. This section of the report begins with a discussion of the study overview and report objectives.

1.1 Study Overview

This report has been prepared as part of the Groundwater for Agriculture Study, which is one of several studies being performed as part of the LSWP. The Groundwater for Agriculture Study includes a wide range of tasks to evaluate wellfield alternatives for pumping an average of 36,000 acre-feet/year of additional groundwater supply to the Irrigation Districts in the Lower Colorado River Basin. The study region includes collecting geohydrological information from eight counties with the primary emphasis on Colorado, Wharton, and Matagorda Counties.

The Groundwater for Agriculture Study is comprised to:

- Perform literature review and data collection to support the development of a conceptual groundwater flow model for the region covered by the proposed groundwater model;
- Develop and calibrate a groundwater model capable of simulating the impacts of the LSWP pumping activities on land subsidence, changes in water quality, saltwater intrusion, reduced well yields, and changes in surface water-groundwater interactions; and
- Design and evaluate alternative LSWP wellfield configurations.

An important aspect of this study is the proper development and application of a groundwater model to simulate the performance and impacts of different wellfield configurations under different pumping scenarios. The success and value of this study to LCRA and SAWS will be determined by the study team's ability to accomplish the following three objectives:

1. Develop a reliable and accurate groundwater model for predicting wellfield impacts.
2. Develop model predictions that correctly simulate the groundwater impacts critical to decision-making.
3. Develop a data collection and modeling approach that provides clear links among field data, model calibration, and model predictions so that the model calibration and predictions can be systematically reproduced and updated with changes or additions to the field data or conceptual model.

1.2 Report Objectives

1.2.1 Background Information

Prior to the initiation of the LSWP, the TWDB (Chowdhury and others, 2004) and the USGS (Slade and others, 2004) had characterized the Colorado River as a losing stream based on a water budget analysis of river gauge data. The Central Gulf Coast GAM developed by the TWDB simulates and characterizes the Colorado River as a losing river (Chowdhury and others, 2004). A losing stream means that there is a net loss of river water to groundwater.

An examination of the USGS and TWDB analyses of the river gauge data by LCRA and the LSWP groundwater team indicate that the Colorado River is a gaining stream. A gaining stream means that there is a net gain of groundwater to the river. Differences between the two sets of analyses can be explained by the fact that the USGS and the TWDB did not properly account for losses associated with river diversions. Specific river flow studies by LCRA and the GW team on the Colorado River confirm that the Colorado River is a gaining stream (Young and Kelley, 2006).

Groundwater flow can have a significant vertical component. This vertical component is important in understanding mixing of groundwater among the different geological formations and between groundwater and surface water. To estimate the direction and rate of vertical groundwater flow, a vertical profile of hydraulic head with depth is needed. This profile is produced by installing wells at different depths and measuring the water table elevations in each well. If there is no vertical groundwater flow, then all of the wells will have the same measurement of depth to groundwater.

Before extensive pumping across the Gulf Coast began in the 1960's and 1970's, there were artesian wells in lower Wharton County and Matagorda County where groundwater flowed freely to the ground surface. The artesian conditions existed because the deeper portions of the Chicot aquifer had a higher hydraulic head than the shallow groundwater system (depths <100 feet). During the last 30 years, however, pumping has reduced the hydraulic head in the deeper Chicot aquifer. This pumping has not only removed artesian conditions but has also produced a downward vertical hydraulic gradient in some regions. Because of the shortage of shallow wells for measuring the hydraulic head in the upper 100 feet of the aquifer, there is considerable uncertainty in quantifying the vertical hydraulic gradients across the LSWP study area.

1.2.2 Report Purpose

The primary purpose of this report is to document the installation of four shallow wells in Matagorda and Wharton Counties. Two of the wells are installed near river gauges on the Colorado River (in the cities of Wharton and Bay City), and two wells are installed in the LCRA Lakeside and Gulf Coast Irrigation Districts (near the cities of Eagle Lake and Wadsworth). Continuous monitoring equipment is installed in all four wells to measure changes in the hydraulic head at 15-minute intervals. Data from all four wells will be used to estimate vertical hydraulic gradients and to calibrate the LSWP groundwater model. Data from the two wells near

the Colorado River will be used to investigate seasonal influences on groundwater surface water interaction.

1.2.3 Report Scope

This report details the entire well installation process beginning with the bidding specifications and ending with the registration process.

The first part of Section 2 provides the well specifications included in the information packages sent to prospective drillers. The last part of Section 2 provides the locations, geologic settings, and well construction for each of the four wells.

Section 3 provides a description of the data collection system installed in each well and a discussion of the initial hydraulic head data collected in April 2006.

Appendix A provides the drilling logs. Appendix B provides copies of the groundwater conservation district registration and the Texas Well Reports. Appendix C provides the detail specification for the data loggers installed in the wells.

2.0 MONITORING WELL INSTALLATION

2.1 Drilling Specifications

Specifications were established for the wells in February 2006. The specifications that were included in bid information packages sent to potential well drilling firms are listed below.

Well Specifications

Four monitoring wells will be installed in Matagorda and Wharton Counties, Texas. Wells must be drilled by a Texas-licensed water well driller who is qualified to drill and install monitoring wells. The installation and development shall be supervised by a licensed professional geoscientist or engineer who is familiar with the geology of the area. The Texas geoscientist will be provided by Baer Engineering.

Locations – Shown on the Attached Maps

- Four locations in Matagorda and Wharton Counties, Texas.
- Two wells will be on the Colorado River floodplain.
- Two wells will be in irrigated areas.
- Sites will be accessible with a truck-mounted drilling rig.

Geologic Materials

- Unconsolidated sand, silt, and clay.

Well Completion

- It is expected that the four wells will be drilled to a maximum depth of 100 feet.
- Each well will contain a minimum of 40 feet of screened interval.
- Screen will be placed across the water table.
- Screen will extend no more than 50 feet below the existing water table.
- Screen will extend 10 feet above the existing water table.

Well Installation

- Hollow stem auger.
- During drilling of the monitoring well, a log of the boring shall be made by a licensed professional geoscientist or engineer who is familiar with the geology of the area. This person will be provided by Baer Engineering.
- No drilling fluids shall be used that have the potential to change the chemistry of the aquifer near the well.
- Auger diameter shall allow completion of a 4-inch diameter well inside the augers.
- The casing and well screen shall be National Sanitary Foundation-certified polyvinyl chloride (PVC) Schedule 40 pipe, flush-thread, screw joint (no glue or

solvents); polytetrafluorethylene (PTFE, such as Teflon) tape or O-rings in the joints; no collar couplings.

- The casing (and screen) shall be cleaned and packaged at the place of manufacture; the packaging shall include a PVC wrapping on each section of casing to keep it from being contaminated prior to installation. The casing shall be free of ink, labels, or other markings.
- The casing (and screen) shall be centered in the hole to allow installation of a good filter pack and annular seal, using appropriately placed centralizers if necessary.
- The well screen shall be compatible with the casing and shall be of the same material. The screen shall not involve the use of any glues or solvents for construction. Field-cut slots are not permitted for well screen. Filter cloth shall not be used.
- The screen opening shall be factory-made 0.010-inch slots (not larger than the smallest fraction of the filter pack).
- A blank-pipe sediment trap (rat-hole), typically 1 to 2 feet, shall be installed below the screen at the bottom of each well. A bottom cap shall be placed on the bottom of the sediment trap. The sediment trap shall not extend through the lower confining layer of the water-bearing zone.
- The filter pack, placed between the screen and the well bore, shall consist of pre-packaged, inert, clean, uniform silica sand and extend from the bottom of the well to 1 foot above the top of the screen.
- The filter pack shall be appropriately sized for the well screen and surrounding soils.
- An annular seal shall be placed on top of the filter pack and shall be at least 2 feet thick.
- The seal shall be composed of bentonite pellets or chips. Special care shall be taken to ensure that fine material or grout does not plug the underlying filter pack. Placement of a few inches of pre-packaged clean fine sand on top of the filter pack will help to prevent migration of the annular seal material into the filter pack.
- The seal shall be placed on top of the filter pack with good distribution and shall be tamped to determine that the seal is thick enough. The bentonite shall be hydrated with clean (potable) water prior to any further activities on the well and left to stand until hydration is complete.
- A casing seal shall be placed on top of the annular seal to prevent fluids and contaminants from entering the borehole from the surface. The casing seal shall consist of a commercial bentonite grout or a cement-bentonite mixture. Drilling spoil, cuttings, or other native materials are not permitted for use as a casing seal. Quick-setting cements are not permitted for use because contaminants may leach from them into the groundwater. The top of the casing seal shall be 3 feet bgs.
- The top of the casing shall be protected by a threaded or slip-on top cap or by a sealing cap or screw-plug seal inserted into the top of the casing. The cap shall be vented to prevent buildup of methane or other gases and shall be designed to prevent moisture from entering the well.
- The top of the casing shall be 2.5 feet above ground level.

- A high-quality, structural-type concrete shall be placed from the top of the casing seal (3 feet bgs) continuously to the top of the ground to form a pad at the surface. This formed surface pad shall be at least 8 inches thick and not less than 4 feet square or 5 feet in diameter.
- The top of the pad shall slope away from the well bore to the edges to prevent ponding of water around the casing or collar.
- A 6-inch diameter (minimum) steel protective pipe collar shall be placed around the casing "stickup" to protect it from damage and unwanted entry. The collar shall be set at least 1 foot into the surface pad during its construction and shall extend 3 inches above the top of the well casing and top cap.
- The top of the collar shall have a lockable top flap or cover. A lock (provided by LCRA) shall be installed.
- A weep hole will be drilled near the base of the protective collar.
- The well number or other designation shall be marked permanently on the protective steel collar.
- The total depth of the well and its elevation shall be marked permanently on the collar.

Well Development

- After installation, each well shall be developed to remove artifacts of drilling (clay films, bentonite pellets in the casing, etc.) and to open the water-bearing zone for maximum flow into the well. Development shall be accomplished using a surge block for a minimum of 30 minutes and/or until freshly pumped water runs clear.

Waste Disposal

- Development water can be discharged to the surface.
- Drill cuttings can be scattered on site. The one exception is the well that will be installed in the Wharton City Park. LCRA will transport those cuttings to another location for disposal.

Well Reports

- Well installation and construction details must be submitted on forms available from the State of Texas within 30 days of well completion.

2.2 Eagle Lake Monitoring Well

2.2.1 Location

The Eagle Lake monitoring well is located about 3 miles east of the intersection of Highway 3013 and County Road 267 in Wharton County. It is at 29.48976° North latitude and 96.26829° West longitude. Figure 1 shows the location of the well. It was completed on March 14, 2006. The well was placed close to LCRA Well #8, which is used periodically to supply water for irrigation. The surrounding area is flat and used for pasture and crop production.



Figure 1. Map of Well Locations.
(Base map is from Texas Atlas & Gazetteer, DeLorme, ©2005.)

2.2.2 Geologic Setting

The well site is underlain by the Pleistocene Lissie Formation, which consists primarily of non-marine sand, silt, and clay. Beneath the Lissie is a thick non-marine sequence of sand, silt, and clay. The geologic material that was penetrated by the well consists of sand from 4 feet to 26 feet deep, clay between 26 and 46 feet deep, and silt from 46 to 48 feet deep. Groundwater was encountered at a depth of 16.6 feet during drilling.

2.2.3 Monitoring Well Construction

The monitoring well was drilled with hollow stem augers that were 11 inches in diameter. Drill cuttings were stockpiled next to the well. The borehole was completed to a depth of 48 feet. The well was constructed inside the augers, and the augers were extracted from the ground as the sand filter pack and bentonite seal were emplaced. The well screen and casing were made of 4-inch-diameter Schedule 40 PVC. The screen had slots that were 0.010 inch wide. Screen was placed from 5.5 to 45.5 feet deep. A boring log for the well is presented in Appendix A.

Figure 2 shows the well near Eagle Lake being drilled. Figure 3 shows the well being constructed. Figure 4 shows the completed well.

Figure 2. Well Near Eagle Lake Being Drilled.



Figure 3. Well Near Eagle Lake Being Constructed.



Figure 4. Completed Well Near Eagle Lake.



2.3 Wharton Monitoring Well

2.3.1 Location

The Wharton monitoring well is located near the Highway 59 bridge over the Colorado River in Wharton. It is at 29.3093° North latitude and 96.1040° West longitude. It was completed on March 30, 2006. The surrounding area is urban.

2.3.2 Geologic Setting

The well site is underlain by Holocene alluvium and fluvial terrace deposits that consist primarily of sand, gravel, silt, and clay. Beneath the river deposits is a thick non-marine sequence of sand, silt, and clay. The geologic material that was penetrated by the well consists of clay from 4 feet to 29.5 feet deep and sand between 29.5 and 70 feet deep. Groundwater was encountered at a depth of about 37.5 feet during drilling.

2.3.3 Monitoring Well Construction

The monitoring well was drilled with hollow stem augers that were 11 inches in diameter. Drill cuttings were used to repair ruts left by the drilling rig. The borehole was completed to a depth of 70 feet. The well was constructed inside the augers, and the augers were extracted from the ground as the sand filter pack and bentonite seal were emplaced. The well screen and casing were made of 4-inch-diameter Schedule 40 PVC. The screen had slots that were 0.010 inch wide. Screen was placed from 26.5 to 66.5 feet deep. A boring log for the well is presented in Appendix A.

Figure 5 shows soil samples being recovered during the drilling of the well in Wharton. Figure 6 shows the completed well next to the Highway 59 bridge.

Figure 5. Sample Recovery at the Well in Wharton.



Figure 6. Completed Well at Wharton.



2.4 Bay City Monitoring Well

2.4.1 Location

The Bay City monitoring well is located about 0.5 mile south of Highway 35 and about 2 miles west of downtown Bay City in Matagorda County. It is at 28.97482° North latitude and 96.01070° West longitude. It was completed on March 15, 2006. The well was placed close to a USGS river gauging station. The surrounding area is used primarily for pasture.

2.4.2 Geologic Setting

The well site is underlain by Holocene alluvium and fluvial terrace deposits that consist primarily of sand, gravel, silt, and clay. Beneath the river deposits is a thick non-marine sequence of sand, silt, and clay. The geologic material that was penetrated by the well consists of sand from 1 foot to 70 feet deep. Groundwater was encountered at a depth of about 40 feet during drilling.

2.4.3 Monitoring Well Construction

The monitoring well was drilled with hollow stem augers that were 11 inches in diameter. Drill cuttings were stockpiled next to the well. The borehole was completed to a depth of 70 feet. The well was constructed inside the augers, and the augers were extracted from the ground as the sand filter pack and bentonite seal were emplaced. The well screen and casing were made of 4-inch-diameter Schedule 40 PVC. The screen had slots that were 0.010 inch wide. Screen was placed from 26 to 66 feet deep. A boring log for the well is presented in Appendix A.

Figure 7 shows the well at Bay City being drilled next to the river gauging station. Figure 8 shows the completed well.

Figure 7. Bay City Well Being Drilled Near the River Gauging Station.



Figure 8. Completed Well at Bay City.



2.5 Wadsworth Monitoring Well

2.5.1 Location

The Wadsworth monitoring well is located on Chinquapin Road about 3 miles east-southeast of the intersection of Highway 60 and County Road 521 in Matagorda County. It is at 28.81791° North latitude and 95.88463° West longitude. It was completed on March 16, 2006. The well was placed close to a lock on the adjacent irrigation canal. The surrounding area is used primarily for pasture.

2.5.2 Geologic Setting

The well site is underlain by the Pleistocene Beaumont Formation, which consists primarily of sand and clay. Beneath the Beaumont is a thick sequence of sand, silt, and clay. The geologic material that was penetrated by the well consists of clay from the surface to 6 feet deep and sand from 6 to 47.5 feet deep. Groundwater was encountered at a depth of about 7.5 feet deep during drilling.

2.5.3 Monitoring Well Construction

The monitoring well was drilled with hollow stem augers that were 11 inches in diameter. Drill cuttings were stockpiled next to the well. The borehole was completed to a depth of 47.5 feet. The well was constructed inside the augers, and the augers were extracted from the ground as the sand filter pack and bentonite seal were emplaced. The well screen and casing were made of 4-inch-diameter Schedule 40 PVC. The screen had slots that were 0.010 inch wide. Screen was placed from 3 to 43 feet deep. A boring log for the well is presented in Appendix A.

Figure 9 shows the well being installed next to an irrigation canal. Figure 10 shows the well being constructed. Figure 11 shows the completed well.

Figure 9. Well Near Wadsworth Being Drilled.



Figure 10. Well Near Wadsworth Being Completed.



Figure 11. Completed Well Near Wadsworth.



2.6 Well Development and Surveying

After installation, each well was developed by bailing until groundwater flowed freely into the well and the turbidity of the water had decreased significantly. The purged water was discharged to the ground.

The wells were secured with padlocks on the steel protective casings. It is expected that the locks will be replaced in the future with locks provided by LCRA.

An LCRA survey crew determined the elevation of the tops of the casings at the four wells and the measuring points at the nearby river gauging stations at the Bay City and Wharton sites. The survey data are presented in the following table.

Table 1. Well Location and Elevation Data

Measuring Point	Latitude	Longitude	Elevation*
Eagle Lake Monitoring Well	29°29'23.088"	-96°16'5.276"	158.02
Wharton Monitoring Well	29°18'34.047"	-96°06'13.931"	103.99
Wharton Gauging Station	29°18'34"	-96°06'13"	52.42
Bay City Monitoring Well	28°58'29.286"	-96°00'38.644"	52.27
Bay City Gauging Station	28°58'29"	-96°00'38"	0.00
Wadsworth Monitoring Well	28°49'03.839"	-95°53'05.437"	31.03

*Measured in feet above sea level, North American Datum 1929.

2.7 Well Registration

The wells were registered with the State of Texas and the local Groundwater Conservation District. The registration information is included in Appendix B.

3.0 WATER LEVEL DATA COLLECTION

3.1 Monitoring Well Installation

On April 11, 2006, data loggers were installed in each of the shall wells. The loggers are Level Troll 500 units manufactured by In-Situ, Inc. The loggers consist of a pressure sensor, power source, and data storage device in a sealed titanium case. An electric cable connects the logger to the surface. Data can be uploaded to a PDA or a laptop computer without retrieving the logger. Specifications for the Level Troll 500 are presented in Appendix C.

The cables to the loggers are attached inside the wells with a Kellerns grip and wire rope thimble, an eyebolt, and quick link on the well casing. A canister of desiccant is attached to the top of each cable to prevent moisture from entering the vent tube in the cable. The desiccant is removed while data are uploaded from the logger. Figure 12 shows the well near Wadsworth being outfitted with a data logger.

Figure 12. Well Near Wadsworth Being Outfitted with a Data Logger.



The Level Troll 500 is designed to measure water levels by sensing pressure changes. The pressure on the logger is directly related to the height of the column of water above it. Atmospheric pressure changes are compensated through the use of a vent tube that connects the pressure sensor in the logger to the air at the surface.

The loggers are designed to read pressures from zero to 15 pounds per square inch (approximately 0 to 35 feet of hydraulic head). The manufacturer's specification for accuracy is 0.02 foot at 15°C, with a precision of 0.002 foot. Each logger was positioned in its well at a depth that would accommodate a wide variation in water level, but not exceed the pressure limit of the logger.

The loggers were programmed to record the pressure and temperature at 15-minute intervals. A calculated value for the depth of the water in the well from the top of the casing is also recorded. Each measurement has a date and time stamp.

Data were collected from April 11, 2006 to April 28, 2006 as a test of the equipment and to allow the loggers and connecting cables to equilibrate in the well environment. On April 28, 2006, the loggers were checked, and the reference depths for water table measurements were adjusted.

The data from the loggers can be imported to Microsoft Excel or other database formats, which allow graphing and other manipulation of the data.

It is expected that data will be retrieved once every 3 months. The next scheduled date for data retrieval is early August 2006. The loggers can store up to 99,500 data points, with each data point consisting of one set of pressure, temperature, and water level readings. By recording data at 15-minute intervals, the logger's memory (1 megabyte) will fill in about 1,000 days. The power supply is expected to last five years.

3.2 Initial Data from April 11 to April 28, 2006

Data were collected from April 11 to April 28 while the logger and cable equilibrated with the environment in the well. The accuracy of the data that were collected during this time may vary, primarily because of stretching of the cable. Measurements made on April 28 had errors that corresponded to an apparent cable stretch of 0.03 foot at Eagle Lake, 0.14 foot at Wharton, 0.10 foot at Bay City, and 0.05 foot at Wadsworth. Consequently, the accuracy of the data should not be considered better than the amounts listed above. Trends in the data are greater than the probable error, and conclusions based on the trends are not expected to be affected. The data are presented here as an initial view into the nature of fluctuations in the groundwater and interactions between the groundwater and the Colorado River at Wharton and Bay City.

Figures 13, 14, 15, and 16 are hydrographs that show the groundwater elevations in the wells near Eagle Lake, Wharton, Bay City, and Wadsworth, respectively, between April 11 and April 28, 2006. The graphs for the wells at Wharton and Bay City also show the elevation of the Colorado River as recorded in nearby USGS gauging stations. Water levels in all wells showed a net rise during the equilibration period of between 0.4 and 0.6 foot.

The two wells located away from the river, at Eagle Lake and Wadsworth, had different long-term trends of increasing (Eagle Lake) or repeated increasing and decreasing (Wadsworth) levels with changes over many days of as much as 0.6 foot. Both wells had regularly distributed, smaller fluctuations of less than 0.05 foot that appeared to occur twice daily. The Eagle Lake well (Figure 13) had a gradual rise in level from about 138.65 feet on April 11 to a maximum of almost 139.05 on April 24 (a rise of about 0.4 foot), followed by a gradual decline to less than 139 feet on April 28. Insufficient information is available to allow for interpretation of these changes.

Figure 13. Hydrograph for the Eagle Lake Monitoring Well

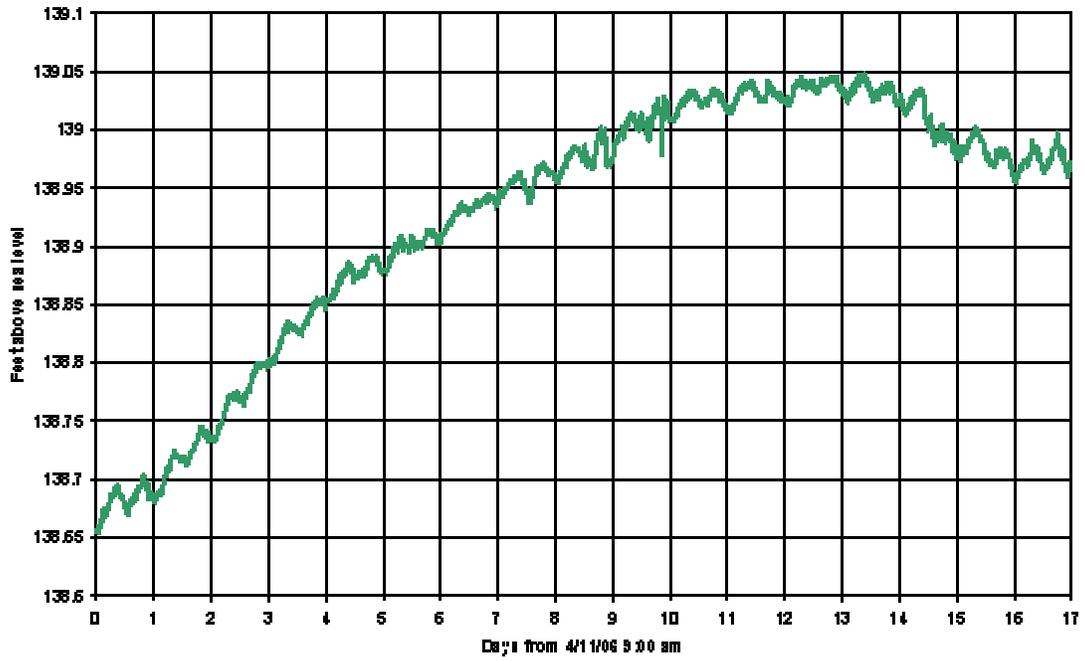


Figure 14. Hydrograph for the Wharton Monitoring Well and Colorado River

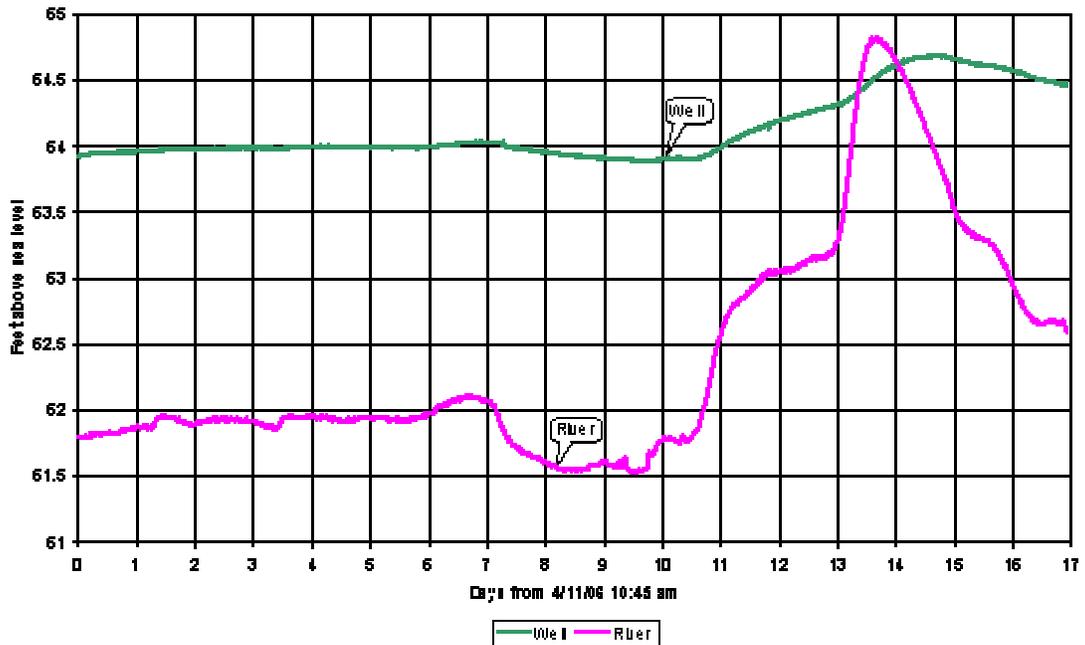


Figure 15. Hydrograph for the Bay City Monitoring Well and Colorado River

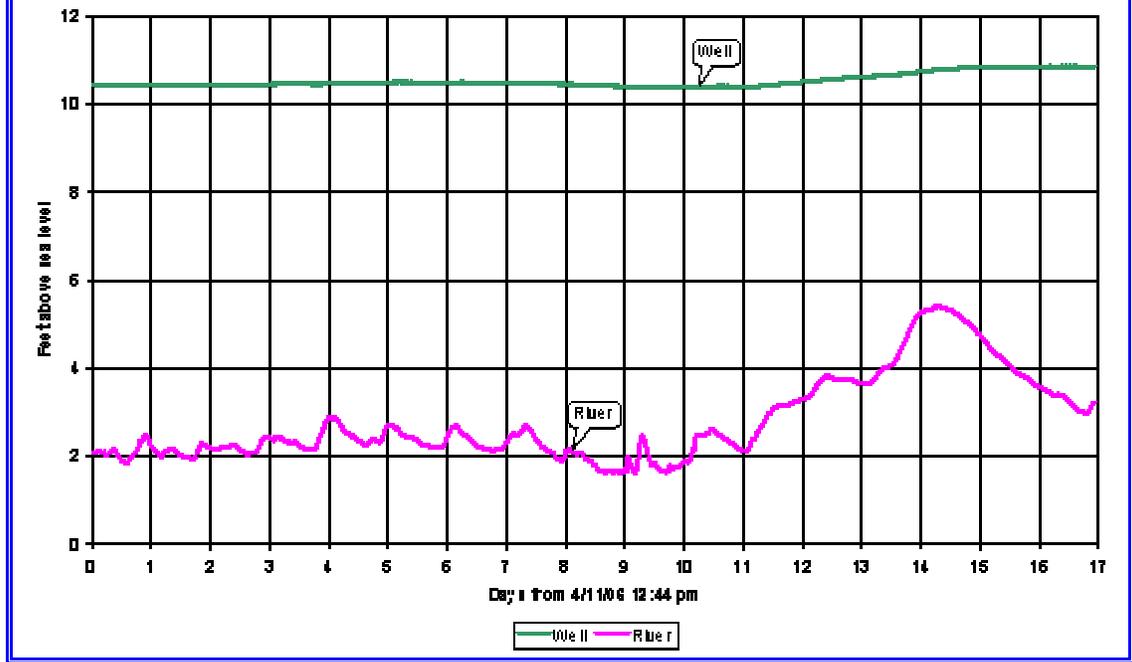
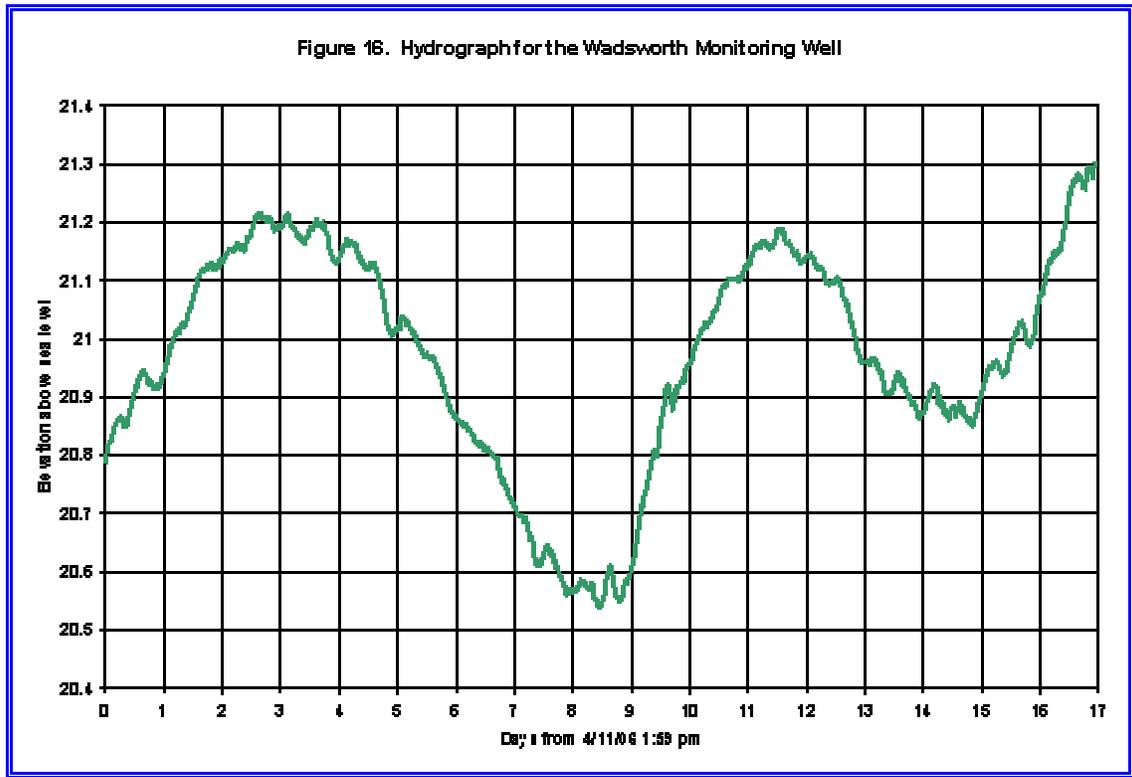


Figure 16. Hydrograph for the Wadsworth Monitoring Well



The Wadsworth well had a periodic fluctuation of as much as 0.6 foot over timespans ranging from about 6 days to almost 9 days. Levels rose about 0.4 foot from April 11 to a peak on April 14 (Friday), gradually diminishing by 0.65 foot to a low on April 19 and 20 (Wednesday and Thursday). Levels gradually rose by 0.65 foot to a peak on April 22 and 23 (Saturday and Sunday), fell by about 0.35 foot to a low on April 25 and 26 (Tuesday and Wednesday), then gradually rose by 0.45 foot and were still trending upward at the conclusion of data collection on April 28 (Friday). It is possible that fluctuations are related to local rainfall. Rainfall records from nearby cities, including Angleton and Wharton, document a widespread rainfall amounting to 0.33 inch at Wharton on April 21. Detailed local precipitation records compiled from weather radar were not reviewed and may record additional events. However, available data do not indicate a relationship between precipitation and water levels in the Wadsworth well. Changes in water levels in the adjacent irrigation canal may be influencing the water levels in the Wadsworth well.

Water levels in the two wells located near the Colorado River, at Wharton (Figure 14) and Bay City (Figure 15), reflect changes in river levels. At Wharton, the river fluctuated from 61.53 to 64.82 feet above sea level during the recording period. The elevation of the water table in the monitoring well at Wharton was -0.32 to 2.40 feet above the elevation of the river, being below the river level only briefly during a discharge peak on April 24. Relative well and river levels indicate that, during this observation period, the groundwater gradient is predominantly directed from the well toward the river.

At Bay City, the river fluctuated from about 1.63 to 5.41 feet above sea level during the recording period. The data appear to be clipped at the lower end of the range, and actual river elevations may at times be lower than 1.63 feet. Although river levels show similar trends to those recorded at Wharton (with about a 20-hour lag because of down-river distance), there is also an approximately daily cyclicity superimposed on the general trend. Daily river level rise and fall of less than 0.7 foot may be associated with tidal cycles. Daily tides on the Texas coast are about 0.5 foot, being as high as 2.5 feet at inlets to bays. The Colorado River discharges directly to the Gulf of Mexico 25 miles downstream from Bay City, where tidal ranges might be similar to those of bay inlets. Note that the elevation of the water table in the monitoring well at Bay City remained from 5.38 to 8.80 feet above the elevation of the Colorado River, again indicating groundwater gradients directed toward the river during the observation period.

4.0 REFERENCES

Chowdhury, A., S. Wade, R.E. Mace, and C. Ridgeway, 2004. "Groundwater Availability of the Central Gulf Coast Aquifer System: Numerical Simulations through 1999." Model Report, Texas Water Development Board.

Slade, F.M., Jr., J.T. Bentley, and A. Michaud, 2002. "Results of Streamflow Gain-Loss Studies in Texas, with Emphasis on Gains from and Losses to Major and Minor Aquifers." U.S. Geological Survey Open-File Report 02-068, published on CD-ROM.

APPENDIX A
BORING LOGS

PROJECT:	LCRA Monitoring Wells		Baer Engineering <i>and Environmental Consulting, Inc.</i>
PROJECT NUMBER:	42020.03		
CLIENT:	URS / LCRA		
BORING / WELL NUMBER:	Eagle Lake	DRILLER:	JEDI
TOTAL DEPTH:	48 feet	DRILLING METHOD:	Hollow Stem Auger
SURFACE ELEVATION:		BORE HOLE DIAMETER:	11 inches
GEOLOGIST:	Mark Zell	DATE AND TIME:	3/13/06 to 3/14/06

DEPTH (FT)	LITHOLOGY	SCREENED INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT)
0			0-0.5	Grass, soil, and gravel	0
			2-3.3	Sandy clay, very dark gray 2.5Y 3/1, dry, firm	
5			4-10	Silty medium sand, light brownish gray 2.5Y 6/2, moist, hard	5
			10-12.7	Silty medium sand as above, but with less silt, soft	10
			12.7-15.2	Medium sand, light brownish gray with rusty mottles, moist to wet, soft	
15			16-26	Coarse sand, quartz, pale yellow 2.5Y 7/3, with some pebbles at 20-21 ft., 23 ft., and 24-25 ft., wet, soft	15
			26-38	Silty clay, reddish brown 5YR 4/4 and light brownish gray 2.5Y 6/2, moist, firm, HCl reaction below 31 ft.	
30			38-42	Silty clay, as above, but with decreasing silt with depth	30
35					35
40					40

PROJECT: LCRA Monitoring Wells
 PROJECT NUMBER: 42020.03
 CLIENT: URS / LCRA



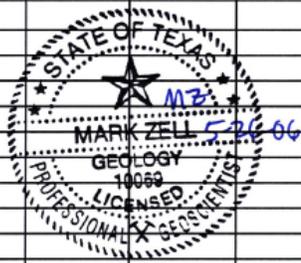
Baer Engineering
 and Environmental Consulting, Inc.

BORING / WELL NUMBER: Eagle Lake
 TOTAL DEPTH: 48 feet
 SURFACE ELEVATION:
 GEOLOGIST: Mark Zell

DRILLER: JEDI
 DRILLING METHOD: Hollow Stem Auger
 BORE HOLE DIAMETER: 11 inches

DATE AND TIME: 3/13/06 to 3/14/06

DEPTH (FT)	LITHOLOGY	SCREENED INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT)
40					0
			42-46	Clay, reddish brown and light brownish gray, moist, firm, HCl reaction	
45					5
			46-48	Silt, brown, more moist than above, soft, HCl reaction	
				Bottom of hole at 48 feet below surface.	
50				Monitoring well details: Casing, Sch. 40 PVC, from 45.5 to 48 ft. Screen, Sch. 40 10-slot PVC, from 5.5 to 45.5 ft. Casing, Sch. 40 PVC, 5.5 deep to 2.5 ft above surface 20-40 sand from 4.5 to 48 ft deep around screen	10
55				3/8-inch bentonite chips from 2.5 to 4.5 ft. deep 6-inch square steel protective lockable casing 4 foot square concrete pad	15
60					20
65					25
70					30
75					35
80					40

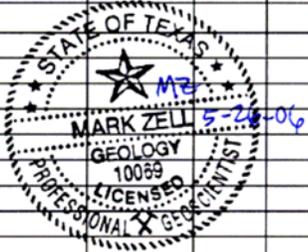


PROJECT:	LCRA Monitoring Wells		Baer Engineering <i>and Environmental Consulting, Inc.</i>
PROJECT NUMBER:	42020.03		
CLIENT:	URS / LCRA		
BORING / WELL NUMBER:	Wadsworth	DRILLER:	JEDI
		DRILLING METHOD:	Hollow Stem Auger
TOTAL DEPTH:	47.5	BORE HOLE DIAMETER:	11 inches
SURFACE ELEVATION:			
GEOLOGIST:	Mark Zell	DATE AND TIME: 3/16/2006	

DEPTH (FT)	LITHOLOGY	SCREENED INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT)
0			0-6	Sandy clay, dark grayish brown 2.5Y 4/2, moist, hard	0
5			6-8	Silty fine sand, strong brown 7.5YR 5/6, moist, firm	5
			8-20	Silty fine sand, as above, wet, soft	
10					10
15					15
20			20-47.5	Fine sand, light brown 7.5YR 6/4, wet, soft, HCl reaction	20
25					25
30					30
35					35
40					40

PROJECT:	LCRA Monitoring Wells		Baer Engineering <i>and Environmental Consulting, Inc.</i>
PROJECT NUMBER:	42020.03		
CLIENT:	URS / LCRA		
BORING / WELL NUMBER:	Wadsworth	DRILLER: JEDI	
TOTAL DEPTH:	47.5 feet	DRILLING METHOD: Hollow Stem Auger	
SURFACE ELEVATION:		BORE HOLE DIAMETER: 11 inches	
GEOLOGIST:	Mark Zell	DATE AND TIME:	3/16/2006

DEPTH (FT)	LITHOLOGY	SCREENED INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT)
40					0
45					5
				Bottom of hole at 47.5 feet below surface.	
50				Monitoring well details: Casing, Sch. 40 PVC, from 43 to 45.5 ft. Screen, Sch. 40 10-slot PVC, from 3 to 43 ft. Casing, Sch. 40 PVC, 3 ft. deep to 2.5 ft above surface 20-40 sand from 2 to 45.5 ft deep around screen	10
55				3/8-inch bentonite chips from 1 to 2 ft. deep 6-inch square steel protective lockable casing 4 foot square concrete pad	15
60					20
65					25
70					30
75					35
80					40

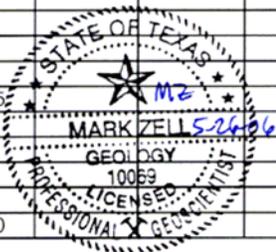


PROJECT:	LCRA Monitoring Wells		Baer Engineering <i>and Environmental Consulting, Inc.</i>
PROJECT NUMBER:	42020.03		
CLIENT:	URS / LCRA		
BORING / WELL NUMBER:	Bay City	DRILLER:	JEDI
TOTAL DEPTH:	70 feet	DRILLING METHOD:	Hollow Stem Auger
SURFACE ELEVATION:		BORE HOLE DIAMETER:	11 inches
GEOLOGIST:	Mark Zell	DATE AND TIME:	3/15/2006

DEPTH (FT)	LITHOLOGY	SCREENED INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT)
0			0-0.5	Silt, dark brown, moist, firm, HCl reaction	0
			0.5-8.7	Very fine sand, pale brown 10YR 6/3, dry, soft, HCl reaction	
5					5
			8.7-15	Very fine and fine sand with several layers of silt, sandy silt, and clay, very dark grayish brown 10YR 3/2 and brown 7.5YR 5/4, dry, soft to firm, HCl reaction	10
15			15-20.5	Silty very fine sand, brown, moist, soft, HCl reaction	15
			20.5-28.4	Alternating fine sand and clay layers, 2-14 inches thick, light yellowish brown to very dark gray, moist, firm, HCl reaction	20
25					25
			28.4-38	Fine sand, light gray 2.5Y 7/2, moist, soft, HCl reaction	
30					30
35					35
			38-70	Fine to medium sand, light gray, wet below 40 ft., flows into augers	
40					40

PROJECT:	LCRA Monitoring Wells	 Baer Engineering <i>and Environmental Consulting, Inc.</i>
PROJECT NUMBER:	42020.03	
CLIENT:	URS / LCRA	
BORING / WELL NUMBER:	Bay City	DRILLER: JEDI
TOTAL DEPTH:	70 feet	DRILLING METHOD: Hollow Stem Auger
SURFACE ELEVATION:		BORE HOLE DIAMETER: 11 inches
GEOLOGIST:	Mark Zell	DATE AND TIME: 3/15/2006

DEPTH (FT)	LITHOLOGY	SCREENED INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT)
40					0
45					5
50					10
55					15
60					20
65					25
70				Bottom of hole at 70 feet below surface.	30
				Monitoring well details:	
				Casing, Sch. 40 PVC, from 66 to 68.5 ft.	
				Screen, Sch. 40 10-slot PVC, from 26 to 66 ft.	
75				Casing, Sch. 40 PVC, 26' deep to 2.5 ft above surface	35
				20-40 sand from 68.5 to 25 ft deep around screen	
				3/8-inch bentonite chips from 23 to 25 ft. deep	
				Grout from 5 to 23 feet deep	
				6-inch square steel protective lockable casing	
80				4 foot square concrete pad	40

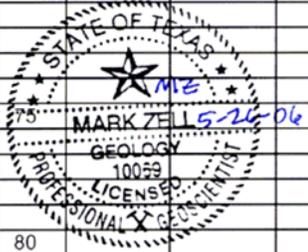


PROJECT:	LCRA Monitoring Wells		Baer Engineering <i>and Environmental Consulting, Inc.</i>
PROJECT NUMBER:	42020.03		
CLIENT:	URS / LCRA		
BORING / WELL NUMBER:	Wharton	DRILLER:	JEDI
TOTAL DEPTH:	70 feet	DRILLING METHOD:	Hollow Stem Auger
SURFACE ELEVATION:		BORE HOLE DIAMETER:	11 inches
GEOLOGIST:	Mark Zell	DATE AND TIME:	3/30/2006

DEPTH (FT)	LITHOLOGY	SCREENED INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT)
0			0-0.5	Sandy silt, dark brown, moist, HCl reaction	0
			0.5-2	Fine sand, reddish brown 5YR 4/3, moist, HCl reaction	
			2-4	No recovery.	
			4-14	Silty clay, dark reddish gray 5YR 4/2 to dark reddish brown 5YR 3/2, moist, HCl reaction, firm	
5					5
10					10
			14-16	Clay, dark gray, firm, weak HCl reaction	
15					15
			16-21.5	Clay with some gravel, grayish brown 2.5Y 5/2, firm, weak HCl reaction, stronger below 18 feet deep	
20					20
			21.5-24	Clay, reddish brown 5YR 5/4, firm, HCl reaction	
			24-26	Silty sandy clay, gray and yellow brown, mottled, moist, firm, HCl reaction	
25					25
			26-29.5	Clayey sandy silt, gray and yellow brown, mottled to 28 ft, mostly gray below 28 ft, moist, HCl reaction	
			29.5-30	Coarse sand with fine and medium sand, gray, soft	
30					30
			30-38	Medium sand with fine and coarse sand and some gravel, pale brown 10YR 6/3, dry to moist, soft, HCl reaction	
35					35
			38-70	Medium sand with some coarse sand, pale brown, soft, wet, flows into augers	
40					40

PROJECT:	LCRA Monitoring Wells	 Baer Engineering <i>and Environmental Consulting, Inc.</i>
PROJECT NUMBER:	42020.03	
CLIENT:	URS / LCRA	
BORING / WELL NUMBER:	Wharton	DRILLER: JEDI
TOTAL DEPTH:	70 feet	DRILLING
SURFACE ELEVATION		METHOD: Hollow Stem Auger
GEOLOGIST:	Mark Zell	BORE HOLE DIAMETER: 11 inches
		DATE AND TIME: 3/30/2006

DEPTH (FT)	LITHOLOGY	SCREENED INTERVAL	DESCRIPTION INTERVAL	DESCRIPTION OF STRATUM	DEPTH (FT)
40					0
45					5
50					10
55					15
60					20
65					25
70				Bottom of hole at 70 feet below surface.	30
				Monitoring well details:	
				Casing, Sch. 40 PVC, from 66.5 to 69 ft.	
				Screen, Sch. 40 10-slot PVC, from 26.5 to 66.5 ft.	
				Casing, Sch. 40 PVC, 26.5' to 2.5 ft above surface	35
				20-40 sand from 69 to 25 ft deep around screen	
				3/8-inch bentonite chips from 25 to 12.5 ft. deep	
				Grout from 2 to 12.5 feet deep	
				6-inch square steel protective lockable casing	
80				4 foot square concrete pad	40



APPENDIX B

**STATE OF TEXAS WELL REPORTS and
GROUNDWATER CONSERVATION DISTRICT REGISTRATIONS**

STATE OF TEXAS WELL REPORT for Tracking #79937

Owner:	Lower Colorado River Authority	Owner Well #:	LCRA Wharton
Address:	P.O. Box 220 Austin , TX 78767	Grid #:	66-48-4
Well Location:	Colorado St. & Richmond Rd. Wharton , TX 77488	Latitude:	29° 18' 41" N
Well County:	Wharton	Longitude:	096° 06' 09" W
Elevation:	No Data	GPS Brand Used:	No Data
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: **3/30/2006**
Completed: **3/31/2006**

Diameter of Hole: Diameter: **10 in From Surface To 70 ft**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: Other: **Sand 20-40**

Annular Seal Data: 1st Interval: **From 2 ft to 24 ft with 5 Bgs Cement (#sacks and material)**
2nd Interval: **From 24 ft to 26 ft with 1 Chips (#sacks and material)**
3rd Interval: **From 26 ft to 70 ft with 40 Sand (#sacks and material)**
Method Used: **poured from surface**
Cemented By: **JEDI**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **JEDI Drilling Contactors, Inc
1911 N. Lexington Blvd.
C.C. , TX 78409**

Driller License Number: **4603**

Licensed Well Driller Signature: **Jose I Medrano, Jr.**

Registered Driller Apprentice Signature: **Oscar D. Garcia**

Apprentice Registration Number: **No Data**

Comments: **No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking number (Tracking #79937) on your written request.

Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

From (ft)	To (ft)	Description
0-30		Clay Tan
30-70		Sand

CASING, BLANK PIPE & WELL SCREEN DATA

Dia.	New/Used	Type	Setting From/To
4 N		PVC Riser	0-28
4 N		PVC Screen	28-68 .010
4 N		PVC Riser	68-70

STATE OF TEXAS WELL REPORT for Tracking #79936

Owner: Lower Colorado River Authority	Owner Well #: LCRA Wadsworth
Address: P.O. Box 220 Austin , TX 78767	Grid #: 81-09-4
Well Location: 3 miles ESE of Hwy 60 Wadsworth , TX 77483	Latitude: 28° 47' 57" N
Well County: Matagorda	Longitude: 095° 59' 11" W
Elevation: No Data	GPS Brand Used: No Data
Type of Work: New Well	Proposed Use: Monitor

Drilling Date: Started: **3/15/2006**
Completed: **3/15/2006**

Diameter of Hole: Diameter: **10 in From Surface To 47.5 ft**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: Other: **Sand 20-40**

Annular Seal Data: 1st Interval: **From 1 ft to 2 ft with 1 Bg. Chips (#sacks and material)**
2nd Interval: **From 2 ft to 47.5 ft with 40 Bgs Sand (#sacks and material)**
3rd Interval: **No Data**
Method Used: **poured from surface**
Cemented By: **JEDI**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **JEDI Drilling Contactors, Inc
1911 N. Lexington Blvd.
C.C. , TX 78409**

Driller License Number: **4603**

Licensed Well Driller Signature: **Jose I Medrano, Jr.**

Registered Driller Apprentice Signature: **Oscar D. Garcia**

Apprentice Registration Number: **No Data**

Comments: **No Data**

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Please include the report's Tracking number (Tracking #79936) on your written request.

Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description
0-10 Clay Tan
10-47.5 Sand

Dia.	New/Used	Type	Setting From/To
4 N		PVC Riser	0-3
4 N		PVC Screen	3-43 .010
4 N		PVC Riser	43-47.5

STATE OF TEXAS WELL REPORT for Tracking #79934

Owner: Lower Colorado River Authority	Owner Well #: LCRA Bay City
Address: P.O. Box 220 Austin , TX 78767	Grid #: 80-08-6
Well Location: 0.5 miles S. Hwy 35 Bay City , TX 77404	Latitude: 28° 57' 28" N
Well County: Matagorda	Longitude: 096° 00' 35" W
Elevation: No Data	GPS Brand Used: No Data
<hr/>	
Type of Work: New Well	Proposed Use: Monitor

Drilling Date: Started: **3/14/2006**
Completed: **3/14/2006**

Diameter of Hole: Diameter: **10 in From Surface To 68.5 ft**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: Other: **Sand 20-40**

Annular Seal Data: 1st Interval: **From 2 ft to 22 ft with 5 Bgs Cement (#sacks and material)**
2nd Interval: **From 22 ft to 24 ft with 1 Chips (#sacks and material)**
3rd Interval: **From 24 ft to 68.5 ft with 40 Sand (#sacks and material)**
Method Used: **poured from surface**
Cemented By: **JEDI**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

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1911 N. Lexington Blvd.
C.C. , TX 78409**

Driller License Number: **4603**

Licensed Well Driller Signature: **Jose I Medrano, Jr.**

Registered Driller Apprentice Signature: **Oscar D. Garcia**

Apprentice Registration Number: **No Data**

Comments: **No Data**

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Please include the report's Tracking number (Tracking #79934) on your written request.

Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description
0-36 Clay Tan
36-68.5 Sand

Dia. New/Used Type Setting From/To
4 N PVC Riser 0-26
4 N PVC Screen 26-66 .010
4 N PVC Riser 66-68.5

STATE OF TEXAS WELL REPORT for Tracking #79933

Owner:	Lower Colorado River Authority	Owner Well #:	LCRA Eagle Lake
Address:	P.O. Box 220 Austin , TX 78767	Grid #:	66-23-3
Well Location:	3 miles E. of Hwy 3013 & CR.267 Eagle Lake , TX 77434	Latitude:	29° 44' 46" N
Well County:	Wharton	Longitude:	096° 09' 04" W
Elevation:	No Data	GPS Brand Used:	No Data
Type of Work:	New Well	Proposed Use:	Monitor

Drilling Date: Started: **3/13/2006**
Completed: **3/13/2006**

Diameter of Hole: Diameter: **10 in From Surface To 48 ft**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: Other: **Sand 20-40**

Annular Seal Data: 1st Interval: **From 2 ft to 3.5 ft with 1 Bg. Chips (#sacks and material)**
2nd Interval: **From 3.5 ft to 48 ft with 40 Bgs Sand (#sacks and material)**
3rd Interval: **No Data**
Method Used: **poured from surface**
Cemented By: **JEDI**
Distance to Septic Field or other Concentrated Contamination: **No Data**
Distance to Property Line: **No Data**
Method of Verification: **No Data**
Approved by Variance: **No Data**

Surface Completion: **Surface Slab Installed**

Water Level: Static level: **No Data**
Artesian flow: **No Data**

Packers: **No Data**

Plugging Info: Casing or Cement/Bentonite left in well: **No Data**

Type Of Pump: **No Data**

Well Tests: **No Data**

Water Quality: Type of Water: **No Data**
Depth of Strata: **No Data**
Chemical Analysis Made: **No**
Did the driller knowingly penetrate any strata which contained undesirable constituents: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the log(s) being returned for completion and resubmittal.

Company Information: **JEDI Drilling Contactors, Inc
1911 N. Lexington Blvd.
C.C. , TX 78409**

Driller License Number: **4603**

Licensed Well Driller Signature: **Jose I Medrano, Jr.**

Registered Driller Apprentice Signature: **Oscar D. Garcia**

Apprentice Registration Number: **No Data**

Comments: **No Data**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking number (Tracking #79933) on your written request.

Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880

DESC. & COLOR OF FORMATION MATERIAL

CASING, BLANK PIPE & WELL SCREEN DATA

From (ft) To (ft) Description
0-10 Clay Tan
10-48 Sand

Dia.	New/Used	Type	Setting From/To
4 N		PVC Riser	0-5.5
4 N		PVC Screen	5.5-45.5 .010
4 N		PVC Riser	45.5-48.0

Coastal Plains GCD, c/o :

NEW WELL REGISTRATION -This form may be faxed or mailed-
Coastal Bend Groundwater Conservation District
109 East Milam Rd
PO Box 341, Wharton, TX 77488
(979) 531-1412 Fax: (979) 531-1002 www.cbgcd.com

District Use Only
Registration No. _____
State Well No. _____

Date: March 3, 2006

Part I - Well Owner and Driller Information:

Well Owner: (if multiple Owners, attach list) Lower Colorado River Authority
Address: 3700 Lake Austin Blvd City: Austin State: Texas Zip: 78303
Phone: (512)-473-3200 ext. 2009 Fax: (512) 397-6722
Email: geoffrey.saunders@lcra.org

Registrant: (if other than owner)*
Address: City: State: Zip:
Phone: Fax: Email:

* If Registrant is other than the owner of the property, the registrant should provide documentation establishing the applicable authority to register the well.

Drilling Company: JEDI (Jones Environmental Drilling Incorporated)
Contact: Bill Jones License #: 4603-M
Address: 1911 North Lexington Blvd City: Corpus Christi State: TX Zip: 78409
Phone: (361) 289-5355 Fax: (361) 289-5377 Email: wjones@bizstx.tx.com

Part II - Proposed Well Location:

Well Site Physical Address or Description (ex. Corner of CR 215 & 218): Southeast of Wadsworth on Chinquapin Road
City: Wadsworth, Matagorda County State: TX Zip 77483
Latitude: 29 (deg) 49 (min) 4.476 (sec) Longitude: 96 (deg) 53 (min) 4.668 (sec) (if unknown/please attach map showing location.)

If proposed casing diameter is 8 inches or larger, attach a list of all known wells within 1500 ft. of proposed well location.

Is the groundwater withdrawn from the well used in a location different from well site? Yes No
If yes, explain:

Will the groundwater produced be transported out of the County? Yes No
If yes, explain:

Part III - Purpose for Water Use:

Mark (x) all appropriate boxes:
 Public Supply (includes commercial) Single-family dwelling (includes lawn irrigation)
 Industrial Multi-family
 Irrigation (All Agricultural Use) Livestock
 Other (explain) Monitoring well to be used as part of the LCRA/SAWS Groundwater Study
When will construction begin? March 2006 When will groundwater production begin? No production
If this well is a replacement well, what will be the status of the old well? Capped Plugged In use, (explain)

(continued on back)...

Part IV – Well Information:

Proposed Maximum pumping capacity of well: 0 (zero) gpm. Proposed depth of well: 75 feet
Inside Diameter of the pump discharge pipe: 4 inches Inside Diameter of Casing: 4 inches

List Proposed Annual Usage: (if agricultural crop irrigation, specify crop & acreage):
(if agricultural crop irrigation, specify crop & acreage):

Use _____ Amount Used _____ gallons or acre ft./year. (circle one)
Use _____ Amount Used _____ gallons or acre ft./year. (circle one)
Use _____ Amount Used _____ gallons or acre ft./year. (circle one)
Use _____ Amount Used _____ gallons or acre ft./year. (circle one)
Use _____ Amount Used _____ gallons or acre ft./year. (circle one)

Total amount of groundwater to be used on an annual basis: 0 gallons or acre ft./year. (circle one)

If the amount stated is less than 5,000,000 gallons per year and the district determines the well exempt under Rule 3.5 as domestic or livestock use, exceeding or pumping water for non-exempt purposes is a violation under the District Rules.)

Part V – Certification:

Applicant agrees that water produced/withdrawn from the proposed well will be put to beneficial use at all times. **Yes or No**
I hereby certify that the information given herewith is true and accurate to the best of my knowledge and belief.
I hereby declare the well owner or authorized registrant will comply with well plugging guidelines & report closure to the District.

Geoffrey Saunders Geoffrey Saunders 3/14/06
Print Name Sr. Hydrologist Signature of Property Owner or Authorized Registrant Date

District Use Only
Will a permit be required for this registration? Yes or No A permit application was provided to registrant on: _____

Coastal Plains GCD, c/o:

NEW WELL REGISTRATION -This form may be faxed or mailed-
 Coastal Bend Groundwater Conservation District
 109 East Milam Rd
 PO Box 341, Wharton, TX 77488
 (979) 531-1412 Fax: (979) 531-1002 www.cbgcd.com

District Use Only
 Registration No. _____
 State Well No. _____

Date: March 3, 2006

Part I - Well Owner and Driller Information:

Well Owner: (if multiple Owners, attach list) Lower Colorado River Authority
 Address: 3700 Lake Austin Blvd City: Austin State: Texas Zip: 78303
 Phone: (512)-473-3200 ext. 2009 Fax: (512) 397-6722
 Email: geoffrey.saunders@lora.org

Registrant: (if other than owner)* _____ Phone: _____
 Address: _____ City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____ Email: _____

* If Registrant is other than the owner of the property, the registrant should provide documentation establishing the applicable authority to register the well.

Drilling Company: JEDI (Jones Environmental Drilling Incorporated)
 Contact: Bill Jones License #: 4603-M
 Address: 1911 North Lexington Blvd City: Corpus Christi State: TX Zip: 78409
 Phone: (361) 289-5355 Fax: (361) 289-5377 Email: wjones@bjestx.rr.com

Part II - Proposed Well Location:

Well Site Physical Address or Description (ex. Corner of CR 215 & 218): southwest of Bay City near Colorado River Gauge on East side of River
 City: Bay City State: TX Zip: 77414
 Latitude: 29 (deg) 58 (min) 29.352 (sec) Longitude: 96 (deg) 06 (min) 38.52 (sec) (if unknown/please attach map showing location.)

If proposed casing diameter is 8 inches or larger, attach a list of all known wells within 1500 ft. of proposed well location.

Is the groundwater withdrawn from the well used in a location different from well site? Yes No
 If yes, explain: _____

Will the groundwater produced be transported out of the County? Yes No
 If yes, explain: _____

Part III - Purpose for Water Use:

Mark (x) all appropriate boxes:
 Public Supply (includes commercial) Single-family dwelling (includes lawn irrigation)
 Industrial Multi-family
 Irrigation (All Agricultural Use) Livestock
 Other (explain) Monitoring well to be used as part of the LCRA/SAWS Groundwater Study

When will construction begin? March 2006 When will groundwater production begin? No production

If this well is a replacement well, what will be the status of the old well? Capped Plugged In use, (explain) _____

(continued on back)...

Part IV - Well Information:

Proposed Maximum pumping capacity of well: 0 (zero) gpm. Proposed depth of well: 75 feet
Inside Diameter of the pump discharge pipe: 4 inches Inside Diameter of Casing: 4 inches

List Proposed Annual Usage. (if agricultural crop irrigation, specify crop & acreage):

(if agricultural crop irrigation, specify crop & acreage):

Use _____	Amount Used _____	gallons or acre ft./year. (circle one)
Use _____	Amount Used _____	gallons or acre ft./year. (circle one)
Use _____	Amount Used _____	gallons or acre ft./year. (circle one)
Use _____	Amount Used _____	gallons or acre ft./year. (circle one)
Use _____	Amount Used _____	gallons or acre ft./year. (circle one)

Total amount of groundwater to be used on an annual basis: 0 gallons or acre ft./year. (circle one)

If the amount stated is less than 5,000,000 gallons per year and the district determines the well exempt under Rule 3.5 as domestic or livestock use, exceeding or pumping water for non-exempt purposes is a violation under the District Rules.

Part V - Certification:

Applicant agrees that water produced/withdrawn from the proposed well will be put to beneficial use at all times. **Yes** or **No**

I hereby certify that the information given herewith is true and accurate to the best of my knowledge and belief.

I hereby declare the well owner or authorized registrant will comply with well plugging guidelines & report closure to the District.

<u>Geoffrey Saunders</u>	<u>Geoffrey Saunders</u>	<u>3/14/06</u>
Print Name <u>Sr. Hydrologist</u>	Signature of Property Owner or Authorized Registrant	Date

<p>District Use Only</p> <p>Will a permit be required for this registration? Yes or No A permit application was provided to registrant on: _____</p>
--

NEW WELL REGISTRATION -This form may be faxed or mailed-
 Coastal Bend Groundwater Conservation District
 109 East Milam Rd
 PO Box 341, Wharton, TX 77488
 (979) 531-1412 Fax: (979) 531-1002 www.cbgcd.com

District Use Only
 Registration No. _____
 State Well No. _____

Date: March 3, 2006

Part I - Well Owner and Driller Information:

Well Owner: (if multiple Owners, attach list) Lower Colorado River Authority
 Address: 3700 Lake Austin Blvd City: Austin State: Texas Zip: 78303
 Phone: (512)-473-3200 ext. 2009 Fax: (512) 397-6722
 Email: geoffrey.saunders@lcra.org

Registrant: (if other than owner)* _____ Phone: _____
 Address: _____ City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____ Email: _____

* If Registrant is other than the owner of the property, the registrant should provide documentation establishing the applicable authority to register the well.

Drilling Company: JEDI (Jones Environmental Drilling Incorporated)
 Contact: Bill Jones License #: 4603-M
 Address: 1911 North Lexington Blvd City: Corpus Christi State: TX Zip: 78409
 Phone: (361) 289-5355 Fax: (361) 289-5377 Email: wjones@bizstx.tx.com

Part II - Proposed Well Location:

Well Site Physical Address or Description (ex. Corner of CR 215 & 218): Near HWY 59 bridge over Colorado River
 City: Wharton State: TX Zip: 77488
 Latitude: 29 (deg) 18 (min) 33.48 (sec) Longitude: 96 (deg) 6 (min) 14.4 (sec) (if unknown please attach map showing location.)

If proposed casing diameter is 8 inches or larger, attach a list of all known wells within 1500 ft. of proposed well location.

Is the groundwater withdrawn from the well used in a location different from well site? Yes No
 If yes, explain: _____

Will the groundwater produced be transported out of the County? Yes No
 If yes, explain: _____

Part III - Purpose for Water Use:

Mark (x) all appropriate boxes:

<input type="checkbox"/> Public Supply (includes commercial)	<input type="checkbox"/> Single-family dwelling. (includes lawn irrigation)
<input type="checkbox"/> Industrial	<input type="checkbox"/> Multi-family
<input type="checkbox"/> Irrigation (All Agricultural Use)	<input type="checkbox"/> Livestock
<input checked="" type="checkbox"/> Other (explain) <u>Monitoring well to be used as part of the LCRA/SAWS Groundwater Study</u>	

When will construction begin? March 2006 When will groundwater production begin? No production
 If this well is a replacement well, what will be the status of the old well? Capped Plugged In use, (explain) _____

(continued on back)...

Part IV – Well Information:

Proposed Maximum pumping capacity of well: 0 (zero) gpm. Proposed depth of well: 75 feet
Inside Diameter of the pump discharge pipe: 4 inches Inside Diameter of Casing: 4 inches

List Proposed Annual Usage. (if agricultural crop irrigation, specify crop & acreage):

(if agricultural crop irrigation, specify crop & acreage):

Use _____	Amount Used _____	gallons or acre ft./year. (circle one)
Use _____	Amount Used _____	gallons or acre ft./year. (circle one)
Use _____	Amount Used _____	gallons or acre ft./year. (circle one)
Use _____	Amount Used _____	gallons or acre ft./year. (circle one)
Use _____	Amount Used _____	gallons or acre ft./year. (circle one)

Total amount of groundwater to be used on an annual basis: 0 gallons or acre ft./year. (circle one)

If the amount stated is less than 5,000,000 gallons per year and the district determines the well exempt under Rule 3.5 as domestic or livestock use, recording or pumping water for non-exempt purposes is a violation under the District Rules.

Part V – Certification:

Applicant agrees that water produced/withdrawn from the proposed well will be put to beneficial use at all times. **Yes** or **No**
I hereby certify that the information given herewith is true and accurate to the best of my knowledge and belief.

I hereby declare the well owner or authorized registrant will comply with well plugging guidelines & report closure to the District.

Geoffrey Saunders Geoffrey Saunders 3/14/06
Print Name Sr. Hydrologist Signature of Property Owner or Authorized Registrant Date

<p>District Use Only Will a permit be required for this registration? Yes or No A permit application was provided to registrant on: _____</p>
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 Coastal Bend Groundwater Conservation District
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 PO Box 341, Wharton, TX 77488
 (979) 531-1412 Fax: (979) 531-1002 www.cbgcd.com

District Use Only
 Registration No. _____
 State Well No. _____

Date: March 3, 2006

Part I - Well Owner and Driller Information:

Well Owner: (if multiple Owners, attach list) Lower Colorado River Authority
 Address: 3700 Lake Austin Blvd _____ City: Austin _____ State: Texas _____ Zip: 78303
 Phone: (512)- 473 -3200 ext. 2009 _____ Fax: (512) 397-6722 _____
 _____ Email: geoffrey.saunders@lcra.org _____

Registrant: (if other than owner)* _____ Phone: _____
 Address: _____ City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____ Email: _____

* If Registrant is other than the owner of the property, the registrant should provide documentation establishing the applicable authority to register the well.

Drilling Company: Jedi (Jones Environmental Drilling Incorporated)
 Contact: Bill Jones _____ License #: 4603-M _____
 Address: 1911 North Lexington Blvd _____ City: Corpus Christi _____ State: TX _____ Zip: 78409
 Phone: (361) 289-5355 _____ Fax: (361) 289-5377 _____ Email: wjjones@bizstx.tx.com _____

Part II - Proposed Well Location:

Well Site Physical Address or Description (ex. Corner of CR 215 & 218): ~7 miles southeast of Eagle Lake on unnamed dirt road in Lakeside Irrigation District
 City: Eagle Lake _____ State: TX _____ Zip: _____
 Latitude: 29 (deg) 29 (min) 23.14 (sec) Longitude: 96 (deg) 16 (min) 5.84 (sec) (if unknown please attach map showing location.)

If proposed casing diameter is six inches or larger, attach a list of all known wells within 1500 ft. of proposed well location.

Is the groundwater withdrawn from the well used in a location different from well site? Yes No
 If yes, explain: _____

Will the groundwater produced be transported out of the County? Yes No
 If yes, explain: _____

Part III - Purpose for Water Use:

Mark (x) all appropriate boxes:
 Public Supply (includes commercial) Single-family dwelling. (includes lawn irrigation)
 Industrial Multi-family
 Irrigation (All Agricultural Use) Livestock
 Other (explain) Monitoring well to be used as part of the LCRA/SAWS Groundwater Study

When will construction begin? March 2006 _____ When will groundwater production begin? No production _____
 If this well is a replacement well, what will be the status of the old well? Capped Plugged In use, (explain) _____

(continued on back)...

Part IV – Well Information:

Proposed Maximum pumping capacity of well: 0 (zero) gpm. Proposed depth of well: 75 feet
Inside Diameter of the pump discharge pipe: 4 inches Inside Diameter of Casing: 4 inches

List Proposed Annual Usage. (if agricultural crop irrigation, specify crop & acreage):

(if agricultural crop irrigation, specify crop & acreage):

Use _____	Amount Used _____	gallons or acre ft./year. (circle one)
Use _____	Amount Used _____	gallons or acre ft./year. (circle one)
Use _____	Amount Used _____	gallons or acre ft./year. (circle one)
Use _____	Amount Used _____	gallons or acre ft./year. (circle one)
Use _____	Amount Used _____	gallons or acre ft./year. (circle one)

Total amount of groundwater to be used on an annual basis: 0 gallons or acre ft./year. (circle one)

If the amount stated is less than 5,000,000 gallons per year and the district determines the well exempts under Rule 5.5 as domestic or livestock use, exceeding or pumping water for non-exempt purposes is a violation under the District Rules.

Part V – Certification:

Applicant agrees that water produced/withdrawn from the proposed well will be put to beneficial use at all times. **Yes or No**
I hereby certify that the information given herewith is true and accurate to the best of my knowledge and belief.
I hereby declare the well owner or authorized registrant will comply with well plugging guidelines & report closure to the District.

<u>Geoffrey Saunders</u>	<u>Geoffrey Saunders</u>	<u>3/13/06</u>
Print Name <u>Sr. Hydrologist</u>	Signature of Property Owner or Authorized Registrant	Date

<p>District Use Only Will a permit be required for this registration? Yes or No A permit application was provided to registrant on: _____</p>

APPENDIX C

LEVEL TROLL 500 (DATA LOGGER) SPECIFICATIONS



Contact us today at
1-970-498-1500
1-800-446-7488

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[Comparison](#) | [Details](#)

Level **TROLL** 500

for
absolute **confidence**
in level monitoring

NEW! Level **TROLL**™ 500



Introducing the *NEW Level TROLL 500*... a breakthrough for water level and temperature monitoring.

The *Level TROLL* contains everything needed for water level measurement and data logging--level and temperature sensors, a data logger, internal power in a 18.3mm (0.72 in) diameter housing with a lot of exciting new capabilities. Since it is built entirely from rugged titanium that is welded to eliminate o-ring seals, you can have total confidence in all applications, even marine environments. The *Level TROLL* is the easiest way to monitor level ever!

With the *Level TROLL*, you'll discover perfect connections with our new Twist-Lock (TM) connectors (patent pending). And, they are extendable--an industry first! Forget having to change batteries. Our new super low-power system guarantees long-term operation plus the unit can be powered with external power. System integration is easy with built-in RS-485/232 Modbus, SDI-12, and 4-20mA communication capability. Are you ready to monitor level with absolute confidence? Try the new *Level TROLL*!

Applications:

- River, lake, stream gauging
- Landslide & flood prevention
- Stormwater monitoring
- Flow measurements
- Research, studies
- Marine buoys
- Water pumping management
- Estuaries and coastal monitoring
- Long-term groundwater monitoring
- Water resource management, dams

Product Details

[Recommended Systems](#)

[Brochure](#)

[Specifications](#)

[Product Details](#)

[Accessories](#)

[Comparison Guide](#)



- Landfill & industrial water levels
- Combined sewer overflow (CSO)
- Mine sites
- Wetland monitoring
- Remediation, brownfields
- Construction dewatering
- Watershed drainage basin monitoring
- Soil vapor extraction (SVE)

Features & Benefits:

- Ultra-rugged, all-titanium design – Perfect for fresh and marine water monitoring. No more worries about corrosion. Excellent for marine, brackish and acidic sites.
- Super accurate sensors – record minute changes in water level and temperature.
- TIG-welded seals – Prevents flooding of instrument.
- Ultra-low power system guarantees 5 years or 2-million data points – Forget changing batteries or running out of power.
- Uses external battery or line power – no worries about running out of power.
- RS-485 MODBUS, SDI-12, and 4-20mA – provides for easy connections to existing and online systems
- Twist-Lock(TM) connectors that “lock” tight – 100% reliability
- Halogen-free cables (LSZH rated) – no worries of toxic fumes if submitted to fire
- Sealed desiccant options – allow for barometric compensation for maximum accuracy while preventing water & humidity intrusion
- Extend cables by simply adding additional segments – maximizes your investment and maintain flexibility with your unit.
- -20 to 80°C temperature range – useful for geothermal and hot spring research and monitoring
- Easiest ever Win-Situ(TM) software – get the data you need fast! Large, sizable display that’s easy to see from a distance.
- Linear logging – perfect for long-term monitoring
- Pause logging feature – Pause logging when removing a unit. Reinstall and restart where you left off!
- Specify start and stop times for logging – collect the data you need up to the date you want and no more
- Ability to “undelete” files from the unit – no worries of accidentally deleting your data.
- Data saved by sites not files – collect and save information by site automatically. No need to transfer data later.
- Easy-to-read memory and battery gauges – know exactly how much is left
- Friendly Wizards guide every step – reduces complicated steps and the need for tedious manuals
- Submersible ranges up to 351m / cable length up to 1200m – measure to the depth you need.
- FCC and CE emission tested – prevents susceptibility to outside emission interference and transient electrical surges
- Version, range, and manufacturing info printed on side of the unit – know the details of the unit without opening the software. Reduces accidental over pressuring

[Click here for more details on the Level TROLL](#)

Specifications

General	
Operating temperature range	-20 to 80C
Dimensions	18.3 mm (0.72 in) OD, 21.6cm (8.5 in) long
Weight (includes hanger)	0.197 kg (0.43 lb)
Output options	Modbus (RS-485/232), SDI-12, 4-20mA
Housing material	Titanium
Nose cone material	Black Delrin (R)

Power	
Internal battery	3.6V Lithium
Typical life*	5 yrs or 2-million dp
External power	8-36VDC
	*Whichever comes first. See battery guide for details.
Logging	
Memory / data records**	1 MB / 100,000+
Logging Rate	User selectable from 0.5 sec -- 49 days
Modbus	0.5 sec
SDI-12	0.5 sec
Measurement Types	Linear, Fast Linear
	**data record = one parameter with timestamp
Level Sensor	Silicon strain gauge
Type	Vented
Material	Titanium
Accuracy, FS	+/-0.05% (15C)
FS = Full Scale	+/-0.1% (-5 to 50C)
	+/-0.25% (-20 to -5C & 50 to 80C)
	*** Accuracy with 4-20mA output option: +/-0.25% typical
Resolution	0.005% FS or better
Range	Vented:
	<ul style="list-style-type: none"> ■ 3.5 m, 11.5 ft (34.4 kPa, 5 psi) ■ 11 m, 35 ft (103.4 kPa, 15 psi) ■ 21 m, 69 ft (206.8 kPa, 30 psi) ■ 70 m, 231 ft (689.5 kPa, 100 psi) ■ 211 m, 692 ft (2068 kPa, 300 psi) ■ 351 m, 1153 ft (500 psi)
	Non-vented:
	<ul style="list-style-type: none"> ■ 21 m, 69 ft (206.8 kPa, 30 psi) ■ 70 m, 231 ft (689.5 kPa, 100 psi) ■ 211 m, 692 ft (2068 kPa, 300 psi) ■ 351 m, 1153 ft (500 psi)
	Note: subtract barometric pressure to obtain usable range
Temperature Sensor	
Material	Silicon
Accuracy	+/-0.1C
Resolution	0.01C or better
Range	-20 to 80C
Rugged Cables with Twist-Lock	
Connectors	
Connector*	Twist-Lock connector OR stripped & tinned wire
Number of conductors	6
Internal Conductor Material	Polypropylene
Diameter 6.7mm (0.265 in)	Break strength 127 kg (280 lbs)
Bend Radius	2X diameter of cable = 13.72mm / 0.54 in
Cable Types:	Vented or Non-Vented Polyurethane
	Vented or Non-Vented Halogen-Free Polyurethane - LSZH rated
	Vented FEP (Generic Teflon(R))

Minimum Computer System Requirements: 400MHz Pentium(R) II, 128MB RAM, 100MB free disk space, Internet Explorer(R) 5.0 or higher, Windows(R) 2000 Professional SP2 or better, or Windows XP Professional SP1 or better

 [Download In-Situ Modbus Networking Specifications | www.modbus.org](#)

[Contact Us](#)

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