



Impairment Verification Monitoring
Dissolved Oxygen
Segment 1815 Cypress Creek
Volume 1
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Texas Engineering Experiment Station
Conrad Blucher Institute

**Impairment Verification Monitoring—Volume 1: Physical, and
Chemical Components
Segment 1815 Cypress Creek**

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EXECUTIVE SUMMARY

This report describes water quality data collected on Cypress Creek (Segment 1815) during the period from August 2002 through December 2002. It has been prepared for the Texas Commission on Environmental Quality (TCEQ) by the Conrad Blucher Institute for Surveying and Science (CBI) at Texas A&M University-Corpus Christi under an inter-agency contract between the TCEQ and the Texas Engineering Experiment Station. Cypress Creek is a 27-mile freshwater stream in the Guadalupe River Basin that extends from the confluence with the Blanco River in Hays County to a point 4.0 miles (6.4 km) upstream of the most upstream unnamed county road crossing in Hays County. The flow is perennial only in the lower 14 miles, where flows are maintained due to springs originating in the Trinity Aquifer at Jacobs Well. Major land uses in this watershed include agriculture and residential. Cypress Creek was included on the 1999 State of Texas Clean Water Act 303(d) list as impaired due to concentrations of dissolved oxygen below criteria associated with an exceptional aquatic life use

Volume 1 presents the water quality data, including TCEQ water quality criteria, for 24-hr dissolved oxygen, pH, water temperature, conductivity, and nutrients. Basic statistics are provided for each water quality constituent by station and sampling type. Volume 2, prepared by project partner Ecological Communications Corporation (ECOMM 2004), describes the biological sampling and analyses conducted by ECOMM.

Water quality assessment has evolved since the 1999 305(b) Water Quality Inventory with the introduction of new methodologies. These include the development of hydrologically unique assessment units, use of the binomial approach for analysis, and the use of 24-hour dissolved oxygen measurements. The Guadalupe-Blanco River Authority also collected 24-hour dissolved oxygen data (independently of this project) on Segment 1815 during 2001-2002, and these results are included in the presentation and discussion of dissolved oxygen. None of the 24-hour dissolved oxygen values (17 samples) had averages or minimums that exceeded their respective TCEQ criteria associated with an exceptional aquatic life use. Routine water samples exhibit nutrient levels well below established screening values. Based upon the 24-hour dissolved oxygen data collected for this study, Cypress Creek is meeting the exceptional aquatic life use and was removed from the 2004 303(d) List for nonsupport of aquatic life uses due to depressed dissolved oxygen.

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INTRODUCTION

Cypress Creek (Segment 1815) is a 27-mile freshwater stream in the Guadalupe River Basin that extends from the confluence with the Blanco River in Hays County to a point 4.0 miles (6.4 km) upstream of the most upstream unnamed county road crossing in Hays County (Figure 1). Its flow is perennial only in the lower 14 miles, where spring flows from the Trinity Aquifer at Jacobs Well support the flow. The watershed includes the City of Wimberley, a resort and retirement community. Major land uses in this watershed include agriculture and residential (Figure 2).

The exceptional aquatic life use in Cypress Creek was identified as impaired in the *2000 Water Quality Inventory* (also known as the Clean Water Act Section 305(b) report). The assessment found that some instantaneous dissolved oxygen samples collected in the lowest 7-mile portion of the stream exhibited concentrations lower than the criterion established to assure optimum conditions for aquatic life. The TCEQ determined that there was an insufficient number of 24-hour dissolved oxygen samples collected since 1999 to allow for a reassessment of standards attainment. In response the TCEQ initiated a project to verify the impairment through the collection of additional physical, chemical, and biological data.

In 2001, TCEQ contracted the services of the South Texas Environmental Institute at Texas A&M University-Kingsville (TAMUK) to lead this effort, together with the Conrad Blucher Institute for Surveying and Science (CBI) at Texas A&M University-Corpus Christi and Ecological Communications Corporations (ECOMM) to design and implement a monitoring plan to verify the impairment and then take the necessary actions to restore uses where necessary. The TAMUK team conducted sampling at two stations on Cypress Creek during August through December 2002 to provide the TCEQ with additional 24-hour dissolved oxygen, physical and chemical analyses, and biological assessments. In September of 2003 CBI took over as the project lead under a contract between the TCEQ and the Texas Engineering Experiment Station (TEES).

The information provided in this report is included in two volumes. Volume 1 describes the physical and chemical data and analyses for water quality on Segment 1815. The 24-hour dissolved oxygen results are presented in tabular and graphical formats and statistical summaries. Other measured constituents include pH, water temperature, conductivity, and nutrient data, for which basic statistics are provided by station and sampling type. Volume 2, prepared by ECOMM (2004), describes the biological sampling, data and analyses conducted by ECOMM on Cypress Creek.

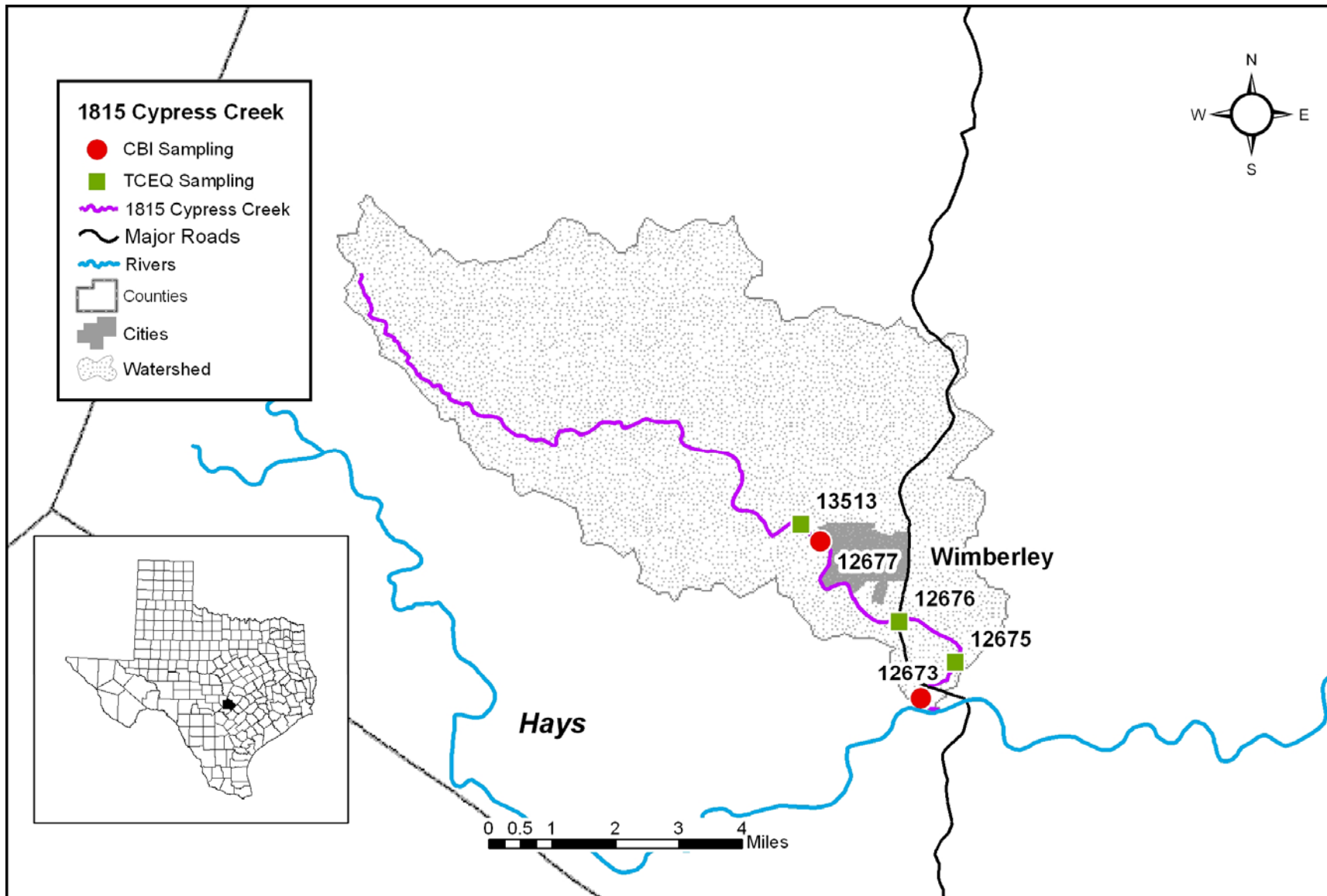


Figure 1. Map showing Station Locations in the lower seven miles of Cypress Creek.

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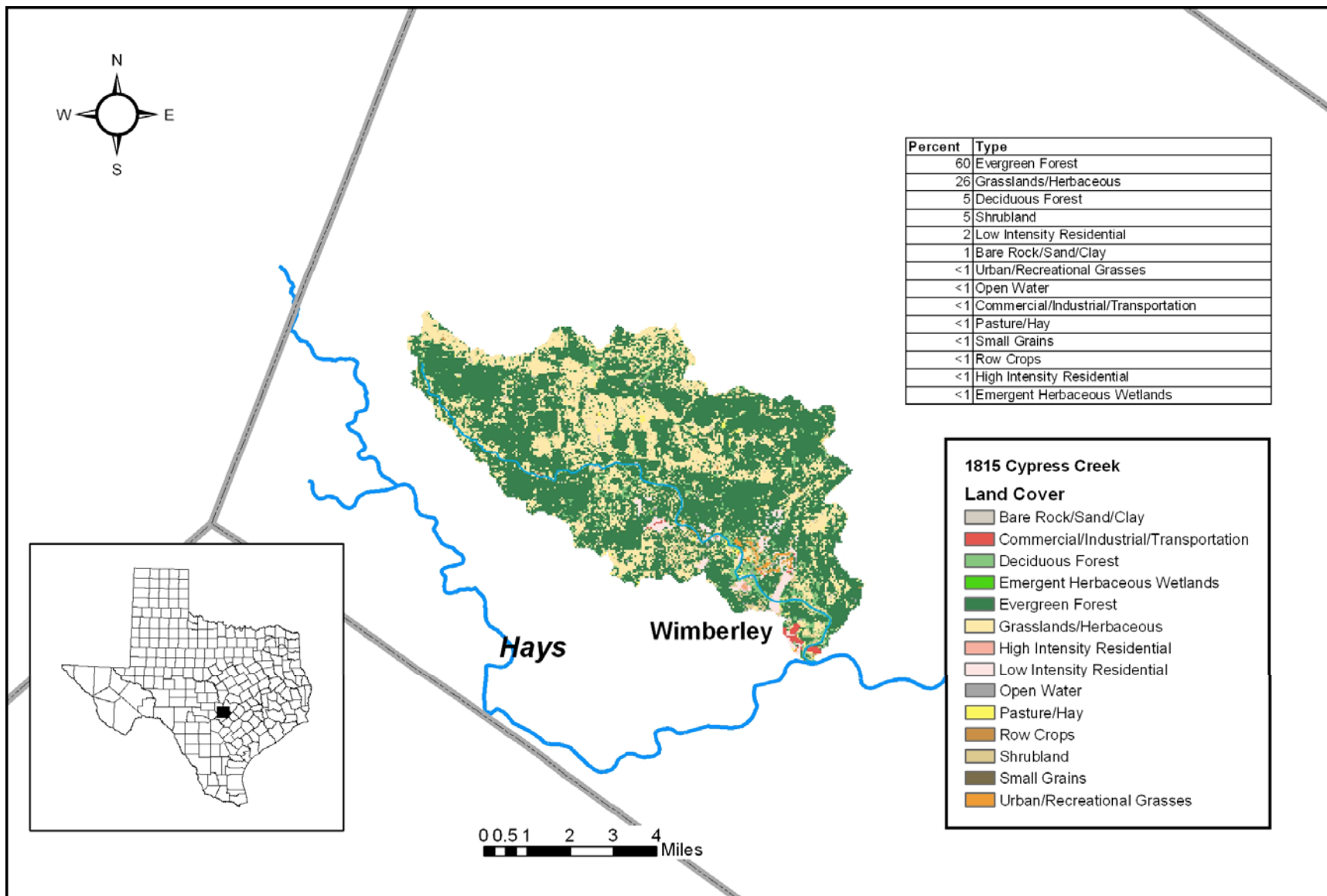


Figure 2. Land Use Map for Segment 1815 of the Cypress Creek Watershed.

HISTORICAL REVIEW

The 2000 303(d) List included Cypress Creek as partially supporting the aquatic life use due to depressed dissolved oxygen levels in the lower seven miles of the stream. The contact recreation, public water supply and general uses were fully supported; fish consumption was not assessed due to insufficient data. The results of the assessment of samples for the 2000 and 2002 Water Quality Inventories are given in Table 1 and Table 2, respectively. A plot of all available historical grab samples of dissolved oxygen for the same period as the 2000 303(d) evaluation period (06/01/1994 - 05/31/1999) is shown in Figure 3. Of the 15 samples shown, two exceed the 6-mg/L average criterion indicated by the heavy line. (Note: the number of historical samples in an assessment period can be greater than the number used for assessment because of assessment criteria.) Table 3 lists all TCEQ Monitoring Stations on this segment, and Figure 4 and Figure 5 are photographs of the two Monitoring Stations sampled by this project.

The segment specific uses and criteria for Cypress Creek, as identified in the 2000 Texas Surface Water Quality Standards (TNRCC 2000), are as follows:

- Exceptional Aquatic Life Use
- Contact Recreation Use
- General Use
- Fish Consumption Use
- Public Water Supply Use

Table 1. Assessment Samples for Segment 1815 Cypress Creek for the 2000 Inventory
(Developed from water quality data collected between June 1, 1994 to May 31, 1999)

| Rec | Segment ID | Year | Uses or Criteria | Method | Samples Taken | Exceeded | Percentage | Mean | Location |
|-----|------------|------|--------------------------|------------------|---------------|----------|------------|------|----------------|
| 1 | 1815 | 1999 | EXCEPTIONAL AQUATIC LIFE | DISSOLVED OXYGEN | 12 | 2 | 16.7 | | ENTIRE SEGMENT |

Table 2. Assessment Samples for Segment 1815 Cypress Creek for the 2002 Inventory
(Developed from water quality data collected between March 1, 1996 and February 28, 2001)

| Rec | Segment ID | Year | Uses or Criteria | Method | Samples Taken | Exceeded | Percentage | Mean | Location |
|-----|------------|------|------------------|-------------------------------|---------------|----------|------------|------|--------------------------|
| 1 | 1815 | 2002 | Aquatic Life Use | Dissolved Oxygen grab average | 14 | 1 | | | Lower 7 miles of segment |
| 2 | 1815 | 2002 | Aquatic Life Use | Dissolved Oxygen grab minimum | 14 | 0 | 0 | | Lower 7 miles of segment |
| 3 | 1815 | 2002 | Aquatic Life Use | Dissolved Oxygen 24hr average | 0 | | | | Lower 7 miles of segment |
| 4 | 1815 | 2002 | Aquatic Life Use | Dissolved Oxygen 24hr minimum | 0 | | | | Lower 7 miles of segment |

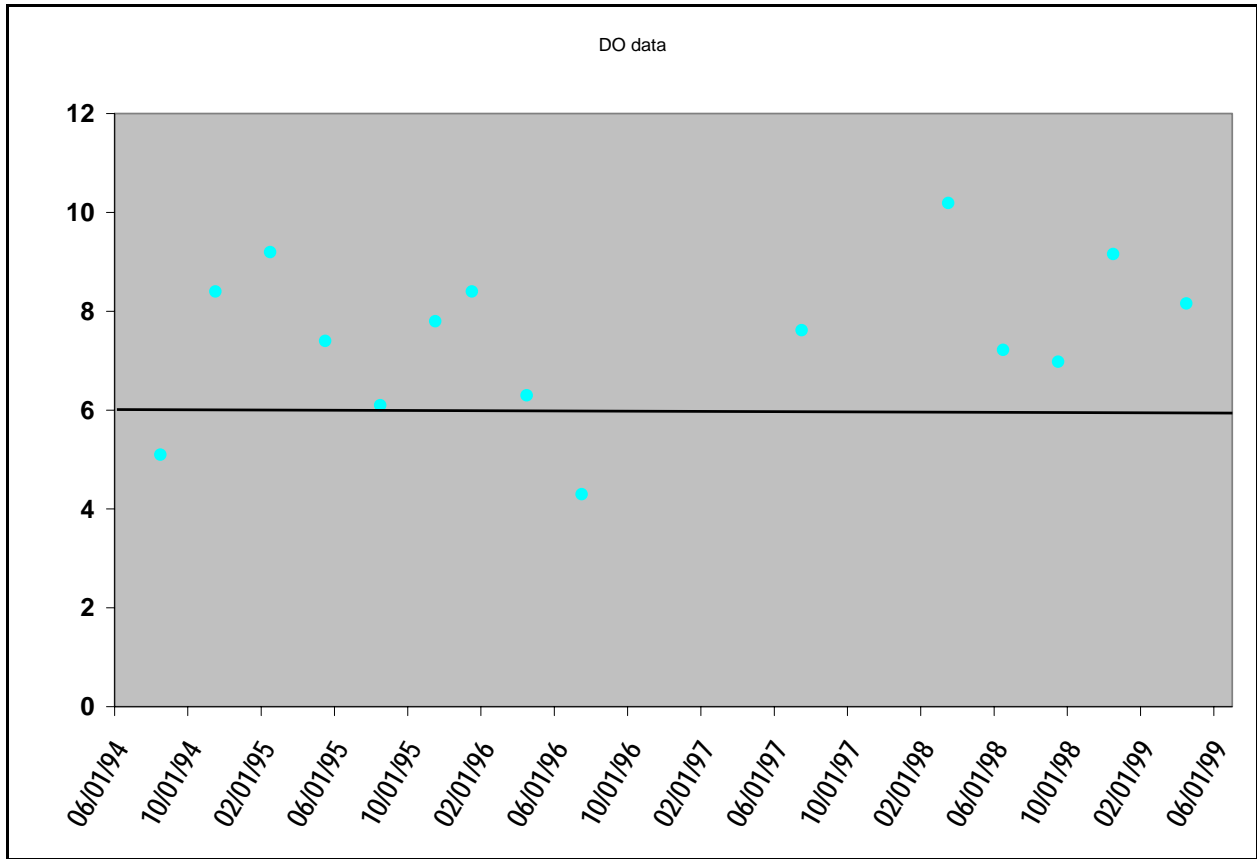


Figure 3. Plot of all available historical grab samples of dissolved oxygen for the period of the 2000 303(d) evaluation period (06/01/94 - 05/31/99). Heavy line indicates 6-mg/L average criterion.

Table 3. All TCEQ Monitoring Stations on Segment 1815. Green shading indicates Stations used in impairment verification monitoring. Figure numbers for photographs for the monitoring stations sampled by this project are indicated in the third column.

| Station | Station Descriptions | Photograph |
|---------|--|------------|
| 12677 | Cypress Creek at Jacob's Well | Figure 5 |
| 12674 | Cypress Creek at FM12 at Wimberley | |
| 12673 | Cypress Creek above confluence with the Blanco River | Figure 4 |



Figure 4. Station 12673, looking upstream.



Figure 5. Station 12677, looking upstream.

PROBLEM DEFINITION

TAMUK and CBI led an effort for the TCEQ to assess the water quality in Cypress Creek (Segment 1815). This segment was included on the 1999 and 2000 State of Texas Clean Water Act 303(d) lists as partially supporting the aquatic life use due to depressed concentrations of dissolved oxygen. The initial phase of the project required that the impairment first be verified through the collection of additional physical, chemical, and biological data to fill in the data gaps and determine what course of action, if any, needed to be taken to address the impairment. The additional data would result in one of four outcomes: 1) removal from the 303(d) List, 2) an evaluation of applicable water quality standards (aquatic life use impairments only), 3) establishing Total Maximum Daily Load (TMDL) for the given constituent and the impairment, or 4) collect additional data (Figure 6).

ASSESSMENT METHODOLOGY

The 2002 305(b) Water Quality Inventory implemented several changes to the guidance for assessing surface waters (Sullivan et al. 2004). These changes were incorporated into the assessment methodologies for this project:

- **Dissolved oxygen monitoring.** The 2000 Water Quality Inventory determined that aquatic life uses on Segment 1815 were impaired primarily based on instantaneous grab samples. This type of sample presents only a small snapshot of the existing water quality conditions. The 2002 Assessment Guidance (TNRCC 2002) specified that impairment determinations requiring restorative actions could only be made using 24-hour composite data, which gives a more accurate representation of the aquatic life uses for the stream. Data collection efforts thus focused on the use of data logging equipment to obtain the correct type data to make reliable use attainment determinations.
- **Development of Assessment Units.** The 2002 Water Quality Inventory also included the use of hydrologically similar portions of entire segments to characterize better the extent of specific use impairment. This approach combines data from several nearby stations to increase the data quantity and, thus, the certainty with respect to the results. Previous assessments considered data from the entire water body to be representative of ambient conditions. The perennial lower 14-mile portion of Cypress Creek is divided into two Assessment Units, but only the lower seven-mile Unit was involved in the impairment verification (Table 4).
- **Binomial Approach.** The 305(b) Water Quality Assessment has incorporated the binomial approach, a statistically-based method for the determination of impairment using varying exceedance percentages based upon the number of samples collected. The binomial approach results in a Type I statistical error that is significantly smaller than that of the previous approach of using a single percent exceedance.

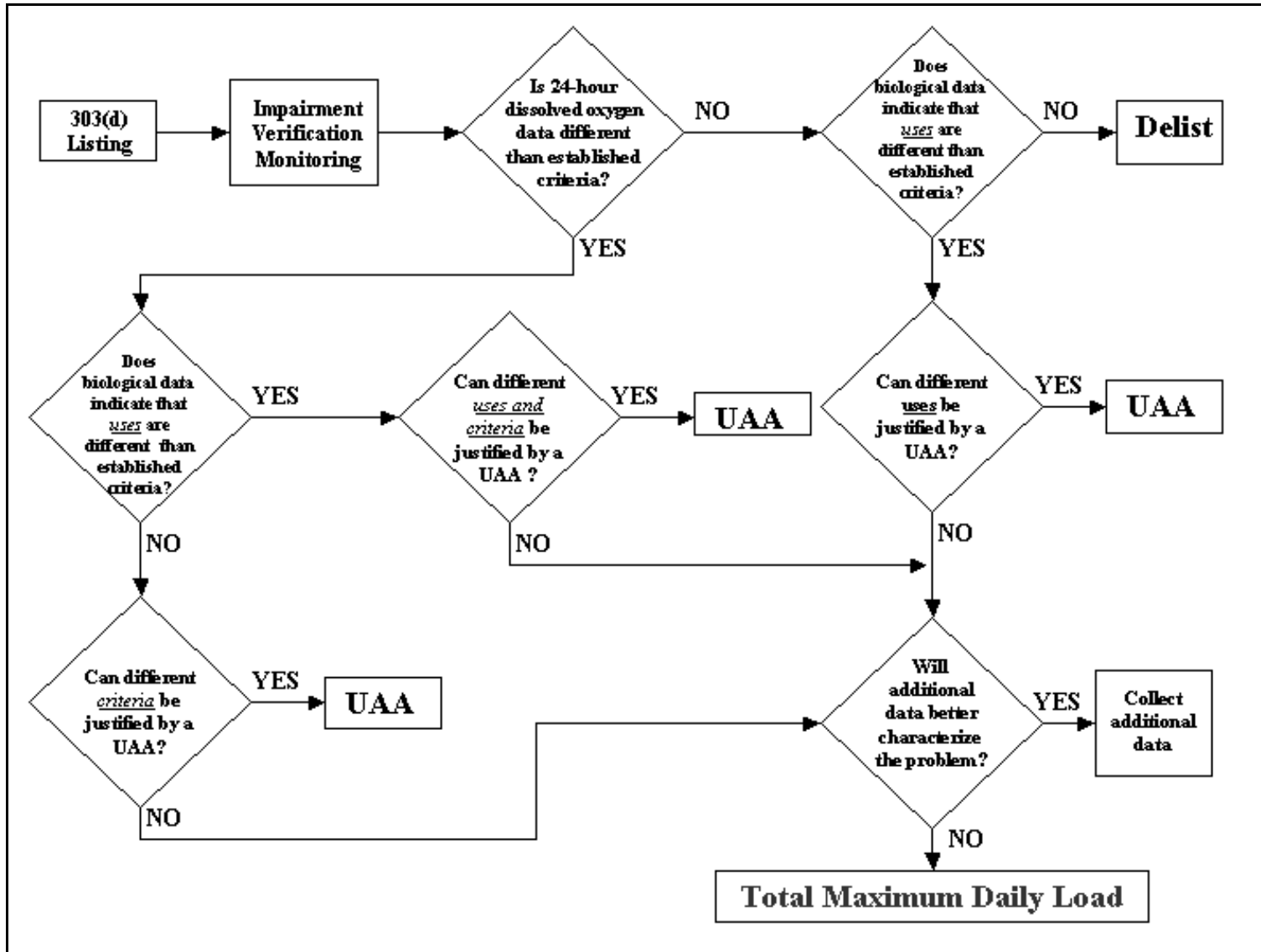


Figure 6 Conceptual Decision Framework

Table 4. Cypress Creek Aquatic Life Assessment Summary

| Segment | Station ID | TMDL Station | TCEQ Station | Assessment Unit Number | Assessment Unit Description | Bacteria Support Status | Aquatic Life Support Status | 24-hr DO Avg Criteria | 24-hr DO Min Criteria |
|---------|------------|--------------|--------------|------------------------|--|-------------------------|-----------------------------|-----------------------|-----------------------|
| 1815 | 12673 | X | X | 1815_01 | From end of segment upstream for 7 miles | FS | FS | 6 mg/L | 4 mg/L |
| | 12674 | X | | | | | | | |
| | 12677 | | X | | | | | | |

QAPP Development

In order to ensure that data collected under this project were scientifically valid and legally defensible, a Quality Assurance Project Plan (QAPP) was developed by TAMUK. This process ensured that all data submitted to the TCEQ have been collected and analyzed in a way that defines its reliability and, therefore, can be used in TMDL development, stream standards modifications, permit decisions, and water quality assessments.

Monitoring Plan Development

In accordance with the QAPP guidelines a monitoring plan was developed by TAMUK to provide the additional water quality data and information identified in the Historical Data Review as necessary to meet the project objectives. The data collected and assessed for this project included physical, chemical, biological, and hydrological parameters. The collection of these data was coordinated with the appropriate Clean River Partners and TCEQ Regional Offices. The monitoring plan was prepared in accordance with the guidelines established by TCEQ in the Surface Water Quality Monitoring Procedures Manual (TCEQ 2003). The monitoring plan identified the monitoring locations, the monitoring frequency, and the criteria for monitoring and data collection. The monitoring plan also identified the types of samples to be collected, the methods used to gather all data, and the parameters analyzed. Locations of the monitoring stations were determined using Global Positioning System (GPS) coordinates. The monitoring plan listed in detail the equipment and supplies necessary to carry out the monitoring effort.

Data Requirements

Data collected on Cypress Creek met requirements for several different outcomes: de-listing of the segment, standards adjustment, or establishing a TMDL. The primary goal in data collection was to ensure that enough data were collected over the critical sampling period to adequately assess, and, if necessary, re-classify the uses for Cypress Creek.

Station Selection

Several factors were considered when sampling stations (Table 3) were selected for impairment verification:

- Accessibility
- Data history
- Water availability
- Repetitiveness
- Geographic location.

Physical/Chemical Sample Collection

Parameters measured at each sampling station are listed in Table 5. In-stream, multi-probe, data loggers measured dissolved oxygen, temperature, pH, and conductivity over a 24-hour period. Flow and stream cross-sections were also measured to estimate loading of various chemical constituents. Samples were collected for laboratory analysis during each station visit. Analyses of these samples included routine TCEQ water monitoring constituents. All sampling procedures were included in the QAPP.

Biological Sample Collection

Biological data were collected on the segment during three separate events. Nekton, benthic, and habitat data were collected during each of these sampling events in accordance with the TCEQ Receiving Waters Assessment Procedures Manual (TNRCC 1999). These data were collected primarily to support a use reclassification, if necessary. Volume 2 presents all biological results and analyses.

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Table 5. Parameters Measured.

| PARAMETER | UNITS | METHOD TYPE | METHOD | STORET Code | AWRL | PRECISION of laboratory duplicates (RPD) | ACCURACY of matrix spikes % Recovery | AWRL Calibration Standard % Recovery | Laboratory Performing Analysis |
|---|--------------------------|------------------------------|------------------------------|--------------|-----------|--|--------------------------------------|--------------------------------------|--------------------------------|
| <i>pH</i> | <i>pH. units</i> | <i>Multi parameter probe</i> | <i>EPA 150.1and TCEQ SOP</i> | <i>00400</i> | <i>NA</i> | <i>10</i> | <i>NA</i> | <i>NA</i> | <i>Field</i> |
| <i>DO</i> | <i>mg/L</i> | <i>Multi parameter probe</i> | <i>EPA 360.1and TCEQ SOP</i> | <i>00300</i> | <i>NA</i> | <i>10</i> | <i>NA</i> | <i>NA</i> | <i>Field</i> |
| <i>DO 24-hr min.</i> | <i>mg/L</i> | <i>Multi parameter probe</i> | <i>EPA 360.1and TCEQ SOP</i> | <i>89855</i> | <i>NA</i> | <i>10</i> | <i>NA</i> | <i>NA</i> | <i>Field</i> |
| <i>DO 24-hr max.</i> | <i>mg/L</i> | <i>Multi parameter probe</i> | <i>EPA 360.1and TCEQ SOP</i> | <i>89856</i> | <i>NA</i> | <i>10</i> | <i>NA</i> | <i>NA</i> | <i>Field</i> |
| <i>DO 24-hr avg.</i> | <i>mg/L</i> | <i>Multi parameter probe</i> | <i>EPA 360.1and TCEQ SOP</i> | <i>89857</i> | <i>NA</i> | <i>10</i> | <i>NA</i> | <i>NA</i> | <i>Field</i> |
| <i>DO number of meas.</i> | <i>mg/L</i> | <i>Multi parameter probe</i> | <i>EPA 360.1and TCEQ SOP</i> | <i>89858</i> | <i>NA</i> | <i>10</i> | <i>NA</i> | <i>NA</i> | <i>Field</i> |
| <i>Conductivity</i> | <i>uS/cm</i> | <i>Multi parameter probe</i> | <i>EPA 120.1and TCEQ SOP</i> | <i>00094</i> | <i>NA</i> | <i>10</i> | <i>NA</i> | <i>NA</i> | <i>Field</i> |
| <i>Temperature</i> | <i>°Celsius</i> | <i>Multi parameter probe</i> | <i>EPA 170.1and TCEQ SOP</i> | <i>00010</i> | <i>NA</i> | <i>10</i> | <i>NA</i> | <i>NA</i> | <i>Field</i> |
| <i>Secchi Depth</i> | <i>meters</i> | <i>Secchi disc</i> | <i>TCEQ SOP</i> | <i>00078</i> | <i>NA</i> | <i>20</i> | <i>NA</i> | <i>NA</i> | <i>Field</i> |
| <i>Days since last significant rainfall</i> | <i>days</i> | | <i>TCEQ SOP</i> | <i>72053</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>Field</i> |
| <i>Flow</i> | <i>cfs</i> | | <i>TCEQ SOP and ADCP</i> | <i>00061</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>Field</i> |
| <i>Flow Severity</i> | <i>1-no flow, 2-low,</i> | | <i>TCEQ SOP</i> | <i>01351</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>NA</i> | <i>Field</i> |

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| PARAMETER | UNITS | METHOD TYPE | METHOD | STORET Code | AWRL | PRECISION of laboratory duplicates (RPD) | ACCURACY of matrix spikes % Recovery | AWRL Calibration Standard % Recovery | Laboratory Performing Analysis |
|-------------------------|---|-------------------------|------------|-------------|------|--|--------------------------------------|--------------------------------------|--------------------------------|
| | 3-normal, 4-flood, 5-high, 6-dry | | | | | | | | |
| TSS | mg/L | gravimetric | EPA 160.2 | 00530 | 4.0 | 20 | NA | NA | SATL |
| TOC | mg/L | combustion-infrared | SM 5310B | 00680 | | | | | SATL |
| Alkalinity | mg/L | titrimetric | EPA 310.1 | 00410 | 10 | 10 | 80-120 | NA | SATL |
| Sulfate | mg/L | turbidimetric | EPA 375.4 | 00945 | 10 | 10 | 80-120 | 75-125 | SATL |
| Chloride | mg/L | titrimetric | SM 4500 | 00940 | 10 | 10 | 80-120 | 75-125 | SATL |
| Ammonia-N | mg/L | titrimetric | EPA 350.2 | 00610 | 0.06 | 10 | 80-120 | 75-125 | SATL |
| O-phosphate-P | mg/L | colorimetric | EPA 365.2 | 00671 | 0.04 | 10 | 80-120 | 75-125 | SATL |
| Nitrate/nitrite-N | mg/L | spectro-photometer | EPA 353.3 | 00631 | 0.04 | 10 | 80-120 | 75-125 | SATL |
| Total Phosphorus | mg/L | colorimetric | EPA 365.2 | 00665 | 0.04 | 10 | 80-120 | 75-125 | SATL |
| Total Kjeldahl Nitrogen | mg/L | ion selective electrode | EPA 351.3 | 00625 | 0.2 | 10 | 80-120 | 75-125 | SATL |
| Chlorophyll-A | ug/L | colorimetric | SM 10200-H | 32211 | 5.0 | 20 | NA | 75-125 | SATL |
| Pheophytin-A | ug/L | colorimetric | SM 10200-H | 32218 | 3.0 | 20 | NA | 75-125 | SATL |
| CBOD | mg/L | incubation | EPA 405.1 | 00307 | 2.0 | 10 | N/A | N/A | SATL |

SATL: San Antonio Testing Laboratory\

AWRL: Ambient Water Reporting Limit

RESULTS

Only one Assessment Unit, covering the lower seven miles of Segment 1815, was applicable for impairment verification. The 24-hour, dissolved-oxygen average values collected by both this project and the GBRA (Table 6) were plotted against the TCEQ standard of 6 mg/L for exceptional aquatic life use (Figure 7). All 17 samples had average dissolved oxygen values well above 5 mg/L. Similarly, the 24-hour minimum values for the 17 samples (Table 7) were well above the TCEQ standard of 4 mg/L (Figure 8). Statistics for the non-critical field and laboratory parameters are presented in Tables 8 and 9, respectively.

Table 6. Statistics for 24-hour DO average values.

| Assessment Unit | Station Identification | Number of Samples | Mean Value | Standard Deviation | Maximum Value | Minimum Value |
|-----------------|------------------------|-------------------|------------|--------------------|---------------|---------------|
| 1815_01 | 12677 | 3 | 6.88 | 0.18 | 7.08 | 6.72 |
| | 12673 | 4 | 7.68 | 0.43 | 8.00 | 7.08 |
| | 12674 | 10 | 8.52 | 1.27 | 11.59 | 6.78 |

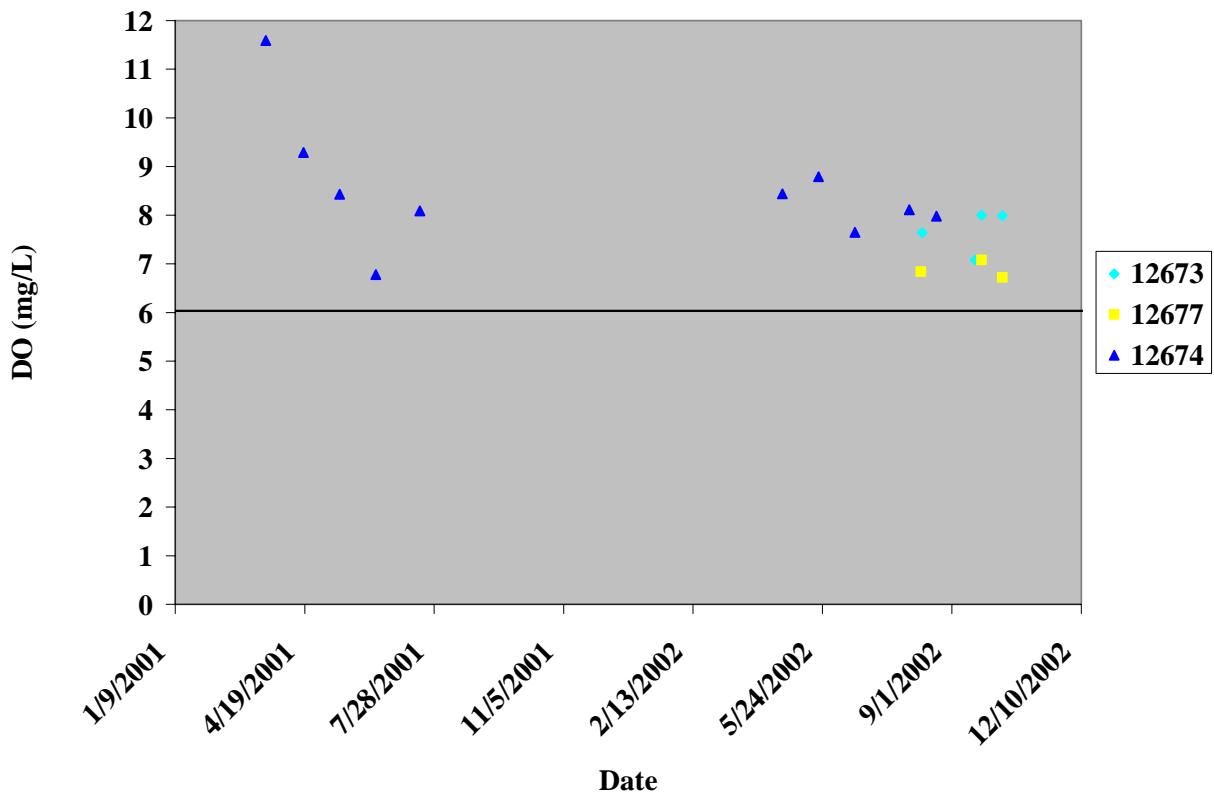


Figure 7. Plot of average 24-hour DO measurements at Stations 12673, 12674, and 12677 (Assessment Unit 1)

Table 7. Statistics for 24-hour DO Minimum Values

| Assessment Unit | Station Identification | Number of Samples | Mean Value | Standard Deviation | Maximum Value | Minimum Value |
|-----------------|------------------------|-------------------|------------|--------------------|---------------|---------------|
| 1815_01 | 12677 | 3 | 6.47 | 0.09 | 6.54 | 6.37 |
| | 12673 | 4 | 7.66 | 0.23 | 7.89 | 7.36 |
| | 12674 | 10 | 8.10 | 1.20 | 11.03 | 6.42 |

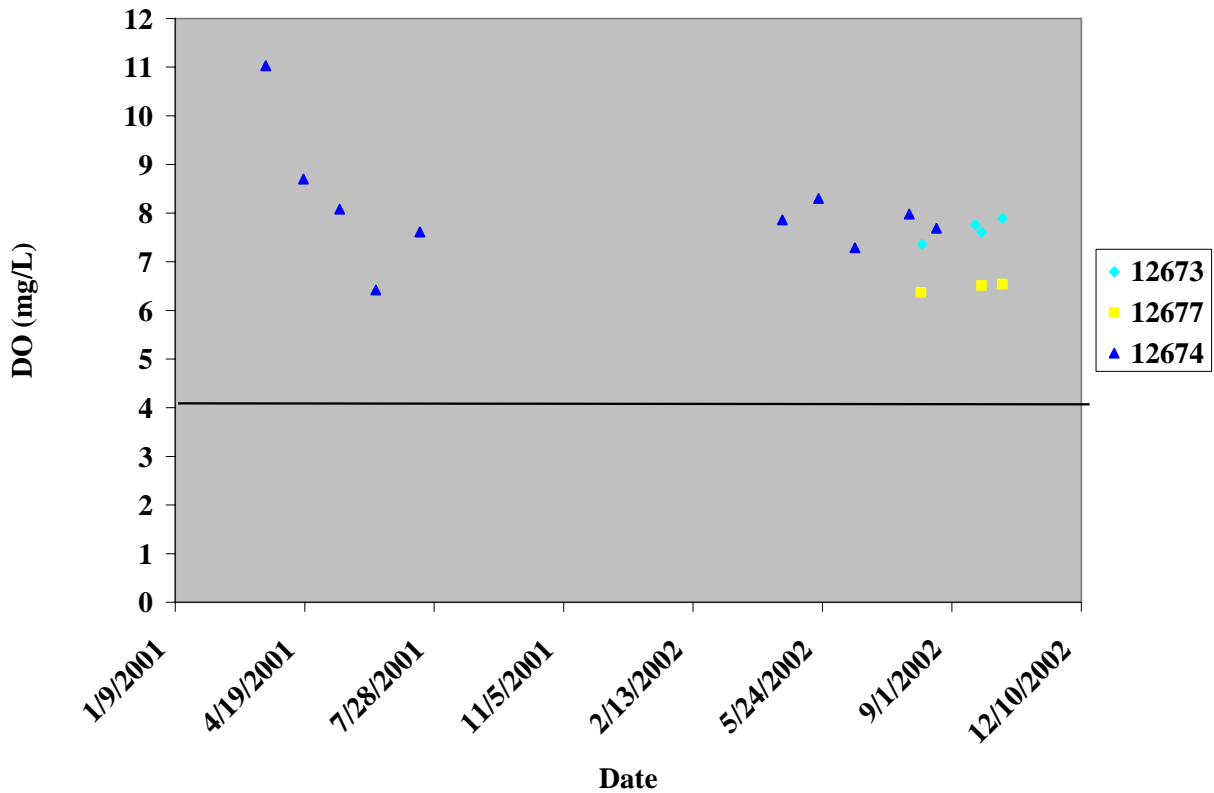


Figure 8. Plot of 24-hr DO minimum measurements at Stations 12673, 12674 and 12677 (Assessment Unit 1)

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Table 8. Statistics for non-critical field parameters

| Station Identification | Parameters | Number of Samples | Mean Value | Standard Deviation | Maximum Value | Minimum Value |
|------------------------|---|-------------------|------------|--------------------|---------------|---------------|
| 12677 | Temp (Celsius) | 4 | 21.27 | 0.39 | 21.67 | 20.85 |
| 12673 | Temp (Celsius) | 4 | 23.26 | 1.56 | 24.98 | 21.80 |
| 12677 | pH | 4 | 7.12 | 0.25 | 7.33 | 6.76 |
| 12673 | pH | 4 | 7.87 | 0.14 | 8.06 | 7.73 |
| 12677 | Spot DO (mg/L) | 3 | 6.98 | 0.40 | 7.40 | 6.60 |
| 12673 | Spot DO (mg/L) | 4 | 7.93 | 0.40 | 8.40 | 7.44 |
| 12677 | Specific Conductivity (microsiemens/cm) | 3 | 554.67 | 38.99 | 586.00 | 511.00 |
| 12673 | Specific Conductivity (microsiemens/cm) | 3 | 442.67 | 58.59 | 503.00 | 386.00 |
| 12677 | 24hr DO Max (mg/L) | 3 | 7.70 | 0.63 | 8.27 | 7.02 |
| 12673 | 24hr DO Max (mg/L) | 4 | 8.52 | 0.26 | 8.79 | 8.23 |
| 12677 | Flow (cfs) | 4 | 19.71 | 11.17 | 35.04 | 9.56 |
| 12673 | Flow (cfs) | 4 | 20.64 | 14.50 | 41.93 | 9.86 |

Table 9. Statistics for laboratory parameters

| Station Identification | Parameter | Number of Samples | Mean Value | Standard Deviation | Maximum Value | Minimum Value |
|------------------------|------------------------|-------------------|------------|--------------------|---------------|---------------|
| 12677 | Alkalinity (mg/L) | 4 | 252.37 | 24.96 | 260.00 | 228.31 |
| 12673 | Alkalinity (mg/L) | 4 | 218.38 | 28.02 | 260.00 | 199.00 |
| 12677 | Chloride (mg/L) | 4 | 9.61 | 1.60 | 11.70 | 8.11 |
| 12673 | Chloride (mg/L) | 4 | 11.20 | 2.73 | 15.20 | 9.09 |
| 12677 | Sulfate (mg/L) | 2 | 14.45 | 0.78 | 15.00 | 13.90 |
| 12673 | Sulfate (mg/L) | 2 | 15.70 | 0.99 | 16.40 | 15.00 |
| 12677 | Ammonia (mg/L) | 2 | 0.08 | 0.02 | 0.10 | 0.07 |
| 12673 | Ammonia (mg/L) | 2 | 0.08 | 0.03 | 0.10 | 0.06 |
| 12677 | Phosphate (mg/L) | 2 | 0.08 | 0.03 | 0.10 | 0/06 |
| 12673 | Phosphate (mg/L) | 2 | 0.08 | 0.03 | 0.10 | 0.06 |
| 12677 | Orthophosphate (mg/L) | 2 | 0.07 | 0.04 | 0.10 | 0.04 |
| 12673 | Orthophosphate (mg/L) | 2 | 0.07 | 0.04 | 0.10 | 0.04 |
| 12677 | TKN (mg/L) | 2 | 0.41 | 0.13 | 0.50 | 0.32 |
| 12673 | TKN (mg/L) | 2 | 0.35 | 0.21 | 0.50 | 0.20 |
| 12677 | TOC (mg/L) | 3 | 2.26 | 1.99 | 4.56 | 1.00 |
| 12673 | TOC (mg/L) | 3 | 2.77 | 1.36 | 4.23 | 1.55 |
| 12677 | Chlorophyll A (ug/L) | 4 | 3.13 | 4.66 | 10.00 | 0.25 |
| 12673 | Chlorophyll A (ug/L) | 4 | 3.13 | 4.66 | 10.00 | 0.35 |
| 12677 | Phenophytin A (ug/L) | 4 | 2.08 | 2.29 | 5.00 | 0.25 |
| 12673 | Phenophytin A (ug/L) | 4 | 1.88 | 2.24 | 5.00 | 0.25 |
| 12677 | Nitrate/Nitrite (mg/L) | 2 | 0.42 | 0.32 | 0.65 | 0.20 |
| 12673 | Nitrate/Nitrite (mg/L) | 2 | 0.28 | 0.11 | 0.36 | 0.20 |

DISCUSSION

Water quality assessment has improved dramatically with introduction of new analytical techniques and methodologies. These include the development of assessment units, the use of the binomial approach for analysis, and the use of 24-hour dissolved oxygen measurements. The most significant improvement directly related to data collected on Segment 1815 is the use of 24-hour dissolved-oxygen averages in place of the historically used instantaneous measurements. The 24-hour average gives a more accurate representation of the true health of the stream in relation to dissolved-oxygen levels. In addition the use of this parameter allows for a more realistic comparison to the 24-hour criterion. Data collected by the TAMUK/CBI team and the GBRA on Cypress Creek indicated no impairment due to depressed levels of dissolved oxygen in the water. None of the 17 24-hour dissolved oxygen samples had average or minimum values that exceeded their respective TCEQ criteria for an exceptional aquatic life use. As a result of these findings, Cypress Creek (Segment 1815) has since been removed from the 2004 303(d) List for nonsupport of aquatic life uses due to depressed dissolved oxygen.

REFERENCES

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ACKNOWLEDGEMENTS

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Appendix A
Fact Sheets

Cypress Creek

Segment: 1815 Guadalupe River Basin

Basin number: 18
Basin group: E
Water body description: From the confluence with the Blanco River in Hays County to a point 6.4 km (4.0 miles) upstream of the most upstream unnamed county road crossing Hays County
Water body classification: Classified
Water body type: Freshwater Stream
Water body length / area: 14 Miles
Water body uses: Aquatic Life Use, Contact Recreation Use, General Use, Fish Consumption Use, Public Water Supply Use

Parameters Removed from the 2002 303(d) List: depressed dissolved oxygen

Additional Information: The aquatic life, contact recreation, public water supply and general uses are fully supported. The fish consumption use was not assessed.

| Monitoring sites used: | | |
|-------------------------------|-------------------|-------------------------------------|
| Assessment Area | Station ID | Station Description |
| Lower 7 miles of segment | 12674 | CYPRESS CREEK AT FM 12 AT WIMBERLEY |

Segment ID: 1815 Water body name: Cypress Creek

Freshwater Stream

Guadalupe River Basin

Total size:

14

Miles

| Assessment Year | Assessment Method | Status of Use Support or Concern | Location | Location size | # of samples | # of exceedances | Mean |
|-----------------|-------------------|----------------------------------|----------|---------------|--------------|------------------|------|
|-----------------|-------------------|----------------------------------|----------|---------------|--------------|------------------|------|

Aquatic Life Use

| | | | | | | | |
|------|-------------------------------|------------------|--------------------------|---|----|---|--|
| 2002 | Dissolved Oxygen grab average | No Concern | Lower 7 miles of segment | 7 | 14 | 1 | |
| 2002 | Dissolved Oxygen grab minimum | Fully Supporting | Lower 7 miles of segment | 7 | 14 | 0 | |
| 2004 | Dissolved Oxygen 24hr average | Fully Supporting | Lower 7 miles of segment | 7 | 10 | 0 | |
| 2004 | Dissolved Oxygen 24hr minimum | Fully Supporting | Lower 7 miles of segment | 7 | 10 | 0 | |
| 2004 | Overall Aquatic Life Use | Fully Supporting | Lower 7 miles of segment | 7 | | | |
| 2004 | Overall Aquatic Life Use | Not Assessed | Upper 7 miles of segment | 7 | | | |

Contact Recreation Use

| | | | | | | | |
|------|-------------------------------|------------------|--------------------------|---|----|---|-----|
| 2002 | E. coli single sample | Fully Supporting | Lower 7 miles of segment | 7 | 11 | 1 | |
| 2002 | E. coli geometric mean | Fully Supporting | Lower 7 miles of segment | 7 | 11 | | 115 |
| 2002 | Fecal coliform single sample | Fully Supporting | Lower 7 miles of segment | 7 | 14 | 2 | |
| 2002 | Fecal coliform geometric mean | Fully Supporting | Lower 7 miles of segment | 7 | 14 | | 132 |
| 2002 | Overall Recreation Use | Fully Supporting | Lower 7 miles of segment | 7 | | | |
| 2002 | Overall Recreation Use | Not Assessed | Upper 7 miles of segment | 7 | | | |

General Use

| | | | | | | | |
|------|-------------------|------------------|--------------------------|---|----|---|------|
| 2002 | Water Temperature | Fully Supporting | Lower 7 miles of segment | 7 | 14 | 0 | |
| 2002 | pH | Fully Supporting | Lower 7 miles of segment | 7 | 14 | 0 | |
| 2002 | Chloride | Fully Supporting | Lower 7 miles of segment | 7 | 17 | | 16.8 |
| 2002 | Chloride | Fully Supporting | Upper 7 miles of segment | 7 | 17 | | 16.8 |
| 2002 | Sulfate | Fully Supporting | Lower 7 miles of segment | 7 | 17 | | 18.2 |

Segment ID: 1815 Water body name: Cypress Creek

Freshwater Stream Guadalupe River Basin Total size: 14 Miles

| Assessment Year | Assessment Method | Status of Use Support or Concern | Location | Location size | # of samples | # of exceedances | Mean |
|-----------------|-------------------|----------------------------------|----------|---------------|--------------|------------------|------|
|-----------------|-------------------|----------------------------------|----------|---------------|--------------|------------------|------|

General Use (continued)

| | | | | | | | |
|------|------------------------|------------------|--------------------------|---|----|--|------|
| 2002 | Sulfate | Fully Supporting | Upper 7 miles of segment | 7 | 17 | | 18.2 |
| 2002 | Total Dissolved Solids | Fully Supporting | Lower 7 miles of segment | 7 | 19 | | 350 |
| 2002 | Total Dissolved Solids | Fully Supporting | Upper 7 miles of segment | 7 | 19 | | 350 |
| 2002 | Overall General Use | Fully Supporting | Lower 7 miles of segment | 7 | | | |
| 2002 | Overall General Use | Fully Supporting | Upper 7 miles of segment | 7 | | | |

Fish Consumption Use

| | | | | | | | |
|------|------------------------------|--------------|--------------------------|---|--|--|--|
| 2002 | Overall Fish Consumption Use | Not Assessed | Lower 7 miles of segment | 7 | | | |
| 2002 | Overall Fish Consumption Use | Not Assessed | Upper 7 miles of segment | 7 | | | |

Public Water Supply Use

| | | | | | | | |
|------|---|------------------|--------------------------|---|----|---|------|
| 2002 | Finished Water: Running Avg | Fully Supporting | Lower 7 miles of segment | 7 | | | |
| 2002 | Surface Water: Long-term average Nitrate+Nitrite Nitrogen | Fully Supporting | Lower 7 miles of segment | 7 | 17 | | 0.17 |
| 2002 | Surface Water: Running average Nitrate+Nitrite Nitrogen | Fully Supporting | Lower 7 miles of segment | 7 | 17 | 0 | |
| 2002 | Overall Public Water Supply Use | Fully Supporting | Lower 7 miles of segment | 7 | | | |
| 2002 | Overall Public Water Supply Use | Fully Supporting | Upper 7 miles of segment | 7 | | | |

Overall Use Support

| | | | | | | | |
|------|--|------------------|--------------------------|---|--|--|--|
| 2004 | | Fully Supporting | Lower 7 miles of segment | 7 | | | |
| 2004 | | Fully Supporting | Upper 7 miles of segment | 7 | | | |

Nutrient Enrichment Concern

| | | | | | | | |
|------|------------------|------------|--------------------------|---|----|---|--|
| 2002 | Ammonia Nitrogen | No Concern | Lower 7 miles of segment | 7 | 17 | 1 | |
|------|------------------|------------|--------------------------|---|----|---|--|

Segment ID: 1815 Water body name: Cypress Creek

Freshwater Stream

Guadalupe River Basin

Total size:

14

Miles

| Assessment Year | Assessment Method | Status of Use Support or Concern | Location | Location size | # of samples | # of exceedances | Mean |
|-----------------|-------------------|----------------------------------|----------|---------------|--------------|------------------|------|
|-----------------|-------------------|----------------------------------|----------|---------------|--------------|------------------|------|

Nutrient Enrichment Concern (continued)

| | | | | | | | |
|------|--------------------------------------|--------------|--------------------------|---|----|---|--|
| 2002 | Nitrite + Nitrate Nitrogen | No Concern | Lower 7 miles of segment | 7 | 17 | 0 | |
| 2002 | Orthophosphorus | Not Assessed | Lower 7 miles of segment | 7 | 6 | 0 | |
| 2002 | Total Phosphorus | No Concern | Lower 7 miles of segment | 7 | 17 | 0 | |
| 2002 | Overall Nutrient Enrichment Concerns | No Concern | Lower 7 miles of segment | 7 | | | |
| 2002 | Overall Nutrient Enrichment Concerns | Not Assessed | Upper 7 miles of segment | 7 | | | |

Algal Growth Concern

| | | | | | | | |
|------|---------------|--------------|--------------------------|---|----|---|--|
| 2002 | Chlorophyll a | No Concern | Lower 7 miles of segment | 7 | 17 | 1 | |
| 2002 | Chlorophyll a | Not Assessed | Upper 7 miles of segment | 7 | | | |

Sediment Contaminants Concern

| | | | | | | | |
|------|---------------------------------------|--------------|--------------------------|---|--|--|--|
| 2002 | Overall Sediment Contaminant Concerns | Not Assessed | Lower 7 miles of segment | 7 | | | |
| 2002 | Overall Sediment Contaminant Concerns | Not Assessed | Upper 7 miles of segment | 7 | | | |

Fish Tissue Contaminants Concern

| | | | | | | | |
|------|--|--------------|--------------------------|---|--|--|--|
| 2002 | Overall Fish Tissue Contaminant Concerns | Not Assessed | Lower 7 miles of segment | 7 | | | |
| 2002 | Overall Fish Tissue Contaminant Concerns | Not Assessed | Upper 7 miles of segment | 7 | | | |

Public Water Supply Concern

| | | | | | | | |
|------|--------------------------|------------|--------------------------|---|--|--|--|
| 2002 | Finished Water: Chloride | No Concern | Lower 7 miles of segment | 7 | | | |
| 2002 | Finished Water: Chloride | No Concern | Upper 7 miles of segment | 7 | | | |

Segment ID: 1815 **Water body name:** Cypress Creek

Freshwater Stream Guadalupe River Basin Total size: 14 Miles

| Assessment Year | Assessment Method | Status of Use Support or Concern | Location | Location size | # of samples | # of exceedances | Mean |
|-----------------|-------------------|----------------------------------|----------|---------------|--------------|------------------|------|
|-----------------|-------------------|----------------------------------|----------|---------------|--------------|------------------|------|

Public Water Supply Concern (continued)

| | | | | | | | |
|------|--------------------------------------|------------|--------------------------|---|--|--|--|
| 2002 | Overall Public Water Supply Concerns | No Concern | Lower 7 miles of segment | 7 | | | |
| 2002 | Overall Public Water Supply Concerns | No Concern | Upper 7 miles of segment | 7 | | | |

Narrative Criteria Concern

| | | | | | | | |
|------|-------------------------------------|------------|--------------------------|---|--|--|--|
| 2002 | Overall Narrative Criteria Concerns | No Concern | Lower 7 miles of segment | 7 | | | |
| 2002 | Overall Narrative Criteria Concerns | No Concern | Upper 7 miles of segment | 7 | | | |

Overall Secondary Concern

| | | | | | | | |
|------|--|------------|--------------------------|---|--|--|--|
| 2002 | | No Concern | Lower 7 miles of segment | 7 | | | |
| 2002 | | No Concern | Upper 7 miles of segment | 7 | | | |

Appendix B
Raw Data

| Stationid | Enddate | STORECODE | DESCRIPTION | GLTL | VALUE |
|-----------|------------|-----------|---|------|--------|
| 12677 | 9/23/2002 | 00814 | Number of benthic invertivore species | | 2 |
| 12673 | 9/23/2002 | 00814 | Number of benthic invertivore species | | 0 |
| 12677 | 9/23/2002 | 00816 | Percentage of individuals as tolerants ex.G.affinis | | 2.6 |
| 12673 | 9/23/2002 | 00816 | Percentage of individuals as tolerants ex.G.affinis | | 15.35 |
| 12673 | 9/23/2002 | 00817 | Number of individuals/seine haul | | 18.83 |
| 12677 | 9/23/2002 | 00817 | Number of individuals/seine haul | | 62.7 |
| 12677 | 9/23/2002 | 00818 | Number of individuals/min electrofishing | | 8.7 |
| 12673 | 9/23/2002 | 00818 | Number of individuals/min electrofishing | | 8.53 |
| 12673 | 9/23/2002 | 00819 | Percentage of ind. as non-native species | | 5.39 |
| 12677 | 9/23/2002 | 00819 | Percentage of ind. as non-native species | | 0.2 |
| 12673 | 9/23/2002 | 00820 | Regional Criteria IBI Score | Hgh | 43 |
| 12677 | 9/23/2002 | 00820 | Regional Criteria IBI Score | Excp | 59 |
| 12673 | 9/23/2002 | 00832 | Total RBP Score | Hgh | 34 |
| 12677 | 9/23/2002 | 00832 | Total RBP Score | Hgh | 30 |
| 12677 | 9/23/2002 | 00833 | Habitat Quality Index | Hgh | 20 |
| 12673 | 9/23/2002 | 00833 | Habitat Quality Index | Int | 18 |
| 12673 | 9/24/2002 | 00940 | CHLORIDE (MG/L AS CL) | | 9.09 |
| 12677 | 9/24/2002 | 00940 | CHLORIDE (MG/L AS CL) | | 8.11 |
| 12673 | 10/10/2002 | 00940 | CHLORIDE (MG/L AS CL) | < | 10 |
| 12677 | 9/19/2002 | 00940 | CHLORIDE (MG/L AS CL) | | 8.64 |
| 12673 | 8/8/2002 | 00940 | CHLORIDE (MG/L AS CL) | | 15.2 |
| 12677 | 10/10/2002 | 00940 | CHLORIDE (MG/L AS CL) | < | 10 |
| 12677 | 8/8/2002 | 00940 | CHLORIDE (MG/L AS CL) | | 11.7 |
| 12673 | 9/19/2002 | 00940 | CHLORIDE (MG/L AS CL) | | 10.49 |
| 12673 | 8/8/2002 | 00945 | SULFATE (MG/L AS SO4) | | 16.4 |
| 12673 | 10/10/2002 | 00945 | SULFATE (MG/L AS SO4) | < | 15 |
| 12677 | 10/10/2002 | 00945 | SULFATE (MG/L AS SO4) | < | 15 |
| 12677 | 8/8/2002 | 00945 | SULFATE (MG/L AS SO4) | | 13.9 |
| 12677 | 9/24/2002 | 01351 | FLOW:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=D | | 3 |
| 12677 | 10/10/2002 | 01351 | FLOW:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=D | | 5 |
| 12673 | 9/24/2002 | 01351 | FLOW:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=D | | 3 |
| 12673 | 10/10/2002 | 01351 | FLOW:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=D | | 5 |
| 12677 | 9/19/2002 | 31616 | FECAL COLIFORM,MEMBR FILTER,M-FC BROTH, #/100ML | | 80 |
| 12677 | 9/24/2002 | 31616 | FECAL COLIFORM,MEMBR FILTER,M-FC BROTH, #/100ML | | 790 |
| 12673 | 9/24/2002 | 31616 | FECAL COLIFORM,MEMBR FILTER,M-FC BROTH, #/100ML | | 660 |
| 12677 | 10/10/2002 | 31616 | FECAL COLIFORM,MEMBR FILTER,M-FC BROTH, #/100ML | | 520 |
| 12673 | 9/19/2002 | 31616 | FECAL COLIFORM,MEMBR FILTER,M-FC BROTH, #/100ML | | 160 |
| 12673 | 10/10/2002 | 31616 | FECAL COLIFORM,MEMBR FILTER,M-FC BROTH, #/100ML | | 800 |
| 12677 | 9/19/2002 | 31699 | E. COLI, COLILERT, IDEXX METHOD, MPN/100ML | | 32.3 |
| 12673 | 8/8/2002 | 31699 | E. COLI, COLILERT, IDEXX METHOD, MPN/100ML | | 83.9 |
| 12677 | 10/10/2002 | 31699 | E. COLI, COLILERT, IDEXX METHOD, MPN/100ML | | 613.1 |
| 12673 | 9/19/2002 | 31699 | E. COLI, COLILERT, IDEXX METHOD, MPN/100ML | | 116.9 |
| 12673 | 9/24/2002 | 31699 | E. COLI, COLILERT, IDEXX METHOD, MPN/100ML | | 121.1 |
| 12677 | 8/8/2002 | 31699 | E. COLI, COLILERT, IDEXX METHOD, MPN/100ML | | 13.4 |
| 12677 | 9/24/2002 | 31699 | E. COLI, COLILERT, IDEXX METHOD, MPN/100ML | | 99 |
| 12673 | 10/10/2002 | 31699 | E. COLI, COLILERT, IDEXX METHOD, MPN/100ML | | 1 |
| 12677 | 8/8/2002 | 32211 | CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH | < | 2 |
| 12677 | 10/10/2002 | 32211 | CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH | < | 10 |
| 12673 | 9/19/2002 | 32211 | CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH | < | 0.25 |
| 12677 | 9/19/2002 | 32211 | CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH | < | 0.25 |
| 12673 | 10/10/2002 | 32211 | CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH | < | 10 |
| 12677 | 9/24/2002 | 32211 | CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH | < | 0.25 |
| 12673 | 8/8/2002 | 32211 | CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH | < | 2 |
| 12673 | 9/24/2002 | 32211 | CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH | < | 0.25 |
| 12673 | 8/8/2002 | 32218 | PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH. | < | 2 |
| 12677 | 10/10/2002 | 32218 | PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH. | < | 5 |
| 12677 | 9/19/2002 | 32218 | PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH. | < | 0.25 |
| 12673 | 9/24/2002 | 32218 | PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH. | < | 0.25 |
| 12673 | 10/10/2002 | 32218 | PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH. | < | 5 |
| 12673 | 9/19/2002 | 32218 | PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH. | < | 0.25 |
| 12677 | 8/8/2002 | 32218 | PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH. | | 2.8 |
| 12677 | 9/24/2002 | 32218 | PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH. | < | 0.25 |
| 12677 | 9/23/2002 | 72052 | STREAMBED SLOPE (FT/FT) | | 0.0051 |
| 12673 | 9/23/2002 | 72052 | STREAMBED SLOPE (FT/FT) | | 0.0081 |
| 12673 | 10/10/2002 | 72053 | DAYS SINCE PRECIPITATION EVENT (DAYS) | | 13 |
| 12677 | 10/10/2002 | 72053 | DAYS SINCE PRECIPITATION EVENT (DAYS) | | 1 |
| 12677 | 8/8/2002 | 72053 | DAYS SINCE PRECIPITATION EVENT (DAYS) | > | 14 |
| 12673 | 9/23/2002 | 84159 | AVERAGE PERCENTAGE INSTREAM COVER | | 18 |
| 12677 | 9/23/2002 | 84159 | AVERAGE PERCENTAGE INSTREAM COVER | | 60 |
| 12673 | 9/23/2002 | 84161 | STREAM ORDER | | 3 |
| 12677 | 9/23/2002 | 84161 | STREAM ORDER | | 3 |
| 12673 | 9/23/2002 | 89832 | NUMBER OF LATERAL TRANSECTS MADE | | 5 |
| 12677 | 9/23/2002 | 89832 | NUMBER OF LATERAL TRANSECTS MADE | | 5 |
| 12673 | 10/10/2002 | 89835 | FLOW MTH 1=Gage Station 2=Elec 3=Mech 4=Weir/Flu | | 2 |
| 12677 | 10/10/2002 | 89835 | FLOW MTH 1=Gage Station 2=Elec 3=Mech 4=Weir/Flu | | 2 |
| 12673 | 8/8/2002 | 89835 | FLOW MTH 1=Gage Station 2=Elec 3=Mech 4=Weir/Flu | | 2 |
| 12677 | 8/8/2002 | 89835 | FLOW MTH 1=Gage Station 2=Elec 3=Mech 4=Weir/Flu | | 2 |
| 12677 | 9/24/2002 | 89835 | FLOW MTH 1=Gage Station 2=Elec 3=Mech 4=Weir/Flu | | 2 |
| 12677 | 9/19/2002 | 89835 | FLOW MTH 1=Gage Station 2=Elec 3=Mech 4=Weir/Flu | | 2 |

| | | | | |
|-------|------------|-------|---|-------|
| 12673 | 9/24/2002 | 89835 | FLOW MTH 1=Gage Station 2=Elec 3=Mech 4=Weir/Flu | 2 |
| 12673 | 9/19/2002 | 89835 | FLOW MTH 1=Gage Station 2=Elec 3=Mech 4=Weir/Flu | 2 |
| 12673 | 9/23/2002 | 89839 | TOTAL NUMBER OF STREAM BENDS | 1 |
| 12677 | 9/23/2002 | 89839 | TOTAL NUMBER OF STREAM BENDS | 1 |
| 12673 | 9/23/2002 | 89840 | NUMBER OF WELL DEFINED STREAM BENDS | 0 |
| 12677 | 9/23/2002 | 89840 | NUMBER OF WELL DEFINED STREAM BENDS | 0 |
| 12677 | 9/23/2002 | 89841 | NUMBER OF MODERATELY DEFINED STREAM BENDS | 0 |
| 12673 | 9/23/2002 | 89841 | NUMBER OF MODERATELY DEFINED STREAM BENDS | 1 |
| 12673 | 9/23/2002 | 89842 | NUMBER OF POORLY DEFINED STREAM BENDS | 0 |
| 12677 | 9/23/2002 | 89842 | NUMBER OF POORLY DEFINED STREAM BENDS | 1 |
| 12673 | 9/23/2002 | 89843 | TOTAL NUMBER OF RIFFLES | 8 |
| 12677 | 9/23/2002 | 89843 | TOTAL NUMBER OF RIFFLES | 1 |
| 12677 | 9/23/2002 | 89844 | DOMINANT SUBSTRATE TYPE | 4 |
| 12673 | 9/23/2002 | 89844 | DOMINANT SUBSTRATE TYPE | 7 |
| 12673 | 9/23/2002 | 89845 | AVERAGE PERCENT OF SUBSTRATE GRAVEL SIZE OR LARG | 23 |
| 12677 | 9/23/2002 | 89845 | AVERAGE PERCENT OF SUBSTRATE GRAVEL SIZE OR LARG | 85 |
| 12673 | 9/23/2002 | 89846 | AVERAGE STREAM BANK EROSION (%) | 18 |
| 12677 | 9/23/2002 | 89846 | AVERAGE STREAM BANK EROSION (%) | 65.5 |
| 12677 | 9/23/2002 | 89847 | AVERAGE STREAM BANK SLOPE (DEGREES) | 84 |
| 12673 | 9/23/2002 | 89847 | AVERAGE STREAM BANK SLOPE (DEGREES) | 56 |
| 12673 | 9/23/2002 | 89849 | AVERAGE PERCENT TREES AS RIPARIAN VEGETATION | 12.5 |
| 12677 | 9/23/2002 | 89849 | AVERAGE PERCENT TREES AS RIPARIAN VEGETATION | 16 |
| 12673 | 9/23/2002 | 89850 | AVERAGE PERCENT SHRUBS AS RIPARIAN VEGETATION | 2 |
| 12677 | 9/23/2002 | 89850 | AVERAGE PERCENT SHRUBS AS RIPARIAN VEGETATION | 1 |
| 12673 | 9/23/2002 | 89851 | AVERAGE PERCENT GRASS AS RIPARIAN VEGETATION | 55 |
| 12677 | 9/23/2002 | 89851 | AVERAGE PERCENT GRASS AS RIPARIAN VEGETATION | 72 |
| 12677 | 9/23/2002 | 89853 | AVERAGE PERCENT OTHER AS RIPARIAN VEGETATION | 11 |
| 12673 | 9/23/2002 | 89853 | AVERAGE PERCENT OTHER AS RIPARIAN VEGETATION | 30.5 |
| 12677 | 9/23/2002 | 89854 | AVERAGE PERCENTAGE OF TREE CANOPY COVERAGE | 73 |
| 12673 | 9/23/2002 | 89854 | AVERAGE PERCENTAGE OF TREE CANOPY COVERAGE | 62 |
| 12677 | 8/8/2002 | 89855 | DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA | 6.37 |
| 12673 | 8/9/2002 | 89855 | DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA | 7.36 |
| 12673 | 9/19/2002 | 89855 | DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA | 7.76 |
| 12677 | 10/10/2002 | 89855 | DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA | 6.54 |
| 12673 | 9/24/2002 | 89855 | DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA | 7.61 |
| 12677 | 9/24/2002 | 89855 | DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA | 6.51 |
| 12673 | 10/10/2002 | 89855 | DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA | 7.89 |
| 12677 | 8/8/2002 | 89856 | DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA | 7.8 |
| 12677 | 10/10/2002 | 89856 | DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA | 7.02 |
| 12673 | 9/19/2002 | 89856 | DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA | 8.79 |
| 12673 | 10/10/2002 | 89856 | DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA | 8.38 |
| 12673 | 8/9/2002 | 89856 | DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA | 8.23 |
| 12677 | 9/24/2002 | 89856 | DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA | 8.27 |
| 12673 | 9/24/2002 | 89856 | DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA | 8.67 |
| 12677 | 10/10/2002 | 89857 | DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA | 6.72 |
| 12677 | 9/24/2002 | 89857 | DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA | 7.08 |
| 12673 | 9/19/2002 | 89857 | DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA | 7.08 |
| 12673 | 10/10/2002 | 89857 | DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA | 7.99 |
| 12673 | 9/24/2002 | 89857 | DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA | 8 |
| 12677 | 8/8/2002 | 89857 | DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA | 6.84 |
| 12673 | 8/9/2002 | 89857 | DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA | 7.64 |
| 12677 | 9/24/2002 | 89858 | DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS | 96 |
| 12673 | 9/19/2002 | 89858 | DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS | 94 |
| 12673 | 10/10/2002 | 89858 | DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS | 88 |
| 12677 | 8/8/2002 | 89858 | DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS | 96 |
| 12673 | 9/24/2002 | 89858 | DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS | 96 |
| 12673 | 8/9/2002 | 89858 | DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS | 96 |
| 12677 | 10/10/2002 | 89858 | DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS | 88 |
| 12673 | 9/23/2002 | 89859 | DRAINAGE AREA ABOVE MOST DOWNSTREAM TRANSECT (KM) | 98.53 |
| 12677 | 9/23/2002 | 89859 | DRAINAGE AREA ABOVE MOST DOWNSTREAM TRANSECT (KM) | 79.5 |
| 12673 | 9/23/2002 | 89860 | LENGTH OF STREAM EVALUATED (KM) | 0.3 |
| 12677 | 9/23/2002 | 89860 | LENGTH OF STREAM EVALUATED (KM) | 0.3 |
| 12677 | 9/23/2002 | 89861 | AVERAGE STREAM WIDTH (METERS) | 14.38 |
| 12673 | 9/23/2002 | 89861 | AVERAGE STREAM WIDTH (METERS) | 18.5 |
| 12673 | 9/23/2002 | 89862 | AVERAGE STREAM DEPTH (METERS) | 0.25 |
| 12677 | 9/23/2002 | 89862 | AVERAGE STREAM DEPTH (METERS) | 0.91 |
| 12673 | 9/23/2002 | 89864 | MAXIMUM POOL WIDTH (METERS) | 19 |
| 12677 | 9/23/2002 | 89864 | MAXIMUM POOL WIDTH (METERS) | 14 |
| 12673 | 9/23/2002 | 89865 | MAXIMUM POOL DEPTH (METERS) | 1 |
| 12677 | 9/23/2002 | 89865 | MAXIMUM POOL DEPTH (METERS) | 2.48 |
| 12673 | 9/23/2002 | 89866 | AVERAGE WIDTH OF NATURAL RIPARIAN VEGETATION (M) | 0 |
| 12677 | 9/23/2002 | 89866 | AVERAGE WIDTH OF NATURAL RIPARIAN VEGETATION (M) | 10 |
| 12673 | 9/23/2002 | 89867 | AESTHETICS (1=WILD 2=NAT. 3=COMM. 4=OFF.) | 3 |
| 12677 | 9/23/2002 | 89867 | AESTHETICS (1=WILD 2=NAT. 3=COMM. 4=OFF.) | 2 |
| 12677 | 9/23/2002 | 89899 | #IND/1=SUBSAMPLE,2=SQFT,3=SQMTR,4=TOTAL KICKNET | 4 |
| 12673 | 9/23/2002 | 89899 | #IND/1=SUBSAMPLE,2=SQFT,3=SQMTR,4=TOTAL KICKNET | 4 |
| 12673 | 9/23/2002 | 89905 | DEBRIS/SHORELINE SAMPLING EFFORT, MINUTES PICKED | 0 |
| 12677 | 9/23/2002 | 89905 | DEBRIS/SHORELINE SAMPLING EFFORT, MINUTES PICKED | 0 |
| 12677 | 9/23/2002 | 89950 | BENTHIC SAMPLER (1=SURB,2=EKM,3=KICK,4=PET,5=H-D | 3 |
| 12673 | 9/23/2002 | 89950 | BENTHIC SAMPLER (1=SURB,2=EKM,3=KICK,4=PET,5=H-D | 3 |

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|-------|------------|-------|--|-------|
| 12677 | 9/23/2002 | 89961 | ECOREGION (TEXAS Ecoregion Code) | 30 |
| 12673 | 9/23/2002 | 89961 | ECOREGION (TEXAS Ecoregion Code) | 30 |
| 12677 | 9/23/2002 | 89976 | AREA SEINED (SQ METERS) | 330 |
| 12673 | 9/23/2002 | 89976 | AREA SEINED (SQ METERS) | 330 |
| 12673 | 9/23/2002 | 90007 | HILSENHOFF BIOTIC INDEX | 4.05 |
| 12677 | 9/23/2002 | 90007 | HILSENHOFF BIOTIC INDEX | 4.69 |
| 12677 | 9/23/2002 | 90008 | EPT INDEX | 3 |
| 12673 | 9/23/2002 | 90008 | EPT INDEX | 7 |
| 12673 | 9/23/2002 | 90009 | NUMBER OF BENTHIC FUNCTIONAL FEEDING GROUPS | 5 |
| 12677 | 9/23/2002 | 90009 | NUMBER OF BENTHIC FUNCTIONAL FEEDING GROUPS | 4 |
| 12677 | 9/23/2002 | 90010 | DOMINANT BENTHIC FUNC FEEDING GRP, % OF COMMUNIT | 42 |
| 12673 | 9/23/2002 | 90010 | DOMINANT BENTHIC FUNC FEEDING GRP, % OF COMMUNIT | 42 |
| 12677 | 9/23/2002 | 90025 | BENTHIC GATHERERS (% OF COMMUNITY) | 9 |
| 12673 | 9/23/2002 | 90025 | BENTHIC GATHERERS (% OF COMMUNITY) | 20 |
| 12677 | 9/23/2002 | 90030 | BENTHIC FILTERERS (% OF COMMUNITY) | 2 |
| 12673 | 9/23/2002 | 90030 | BENTHIC FILTERERS (% OF COMMUNITY) | 42 |
| 12677 | 9/23/2002 | 90035 | BENTHIC SHREDDERS (% OF COMMUNITY) | 0 |
| 12673 | 9/23/2002 | 90035 | BENTHIC SHREDDERS (% OF COMMUNITY) | 4 |
| 12677 | 9/23/2002 | 90036 | BENTHIC PREDATORS (% OF COMMUNITY) | 42 |
| 12673 | 9/23/2002 | 90036 | BENTHIC PREDATORS (% OF COMMUNITY) | 22 |
| 12673 | 9/23/2002 | 90042 | PERCENT DOMINANT TAXON, BENTHOS | 31.43 |
| 12677 | 9/23/2002 | 90042 | PERCENT DOMINANT TAXON, BENTHOS | 41.94 |
| 12673 | 9/23/2002 | 90050 | RATIO OF INTOLERANT TO TOLERANT TAXA, BENTHOS | 3.46 |
| 12677 | 9/23/2002 | 90050 | RATIO OF INTOLERANT TO TOLERANT TAXA, BENTHOS | 2.16 |
| 12673 | 9/23/2002 | 90052 | NUMBER OF NON-INSECT TAXA | 3 |
| 12677 | 9/23/2002 | 90052 | NUMBER OF NON-INSECT TAXA | 4 |
| 12673 | 9/23/2002 | 90054 | PERCENT OF TOTAL NUMBER AS ELMIDAE | 0 |
| 12677 | 9/23/2002 | 90054 | PERCENT OF TOTAL NUMBER AS ELMIDAE | 0 |
| 12677 | 9/23/2002 | 92266 | TRICHOPTERA | 0 |
| 12673 | 9/23/2002 | 92266 | TRICHOPTERA | 4.35 |
| 12677 | 9/23/2002 | 92491 | CHIRONOMIDAE | 1.61 |
| 12673 | 9/23/2002 | 92491 | CHIRONOMIDAE | 2.86 |
| 12677 | 9/23/2002 | 98003 | NUMBER OF SPECIES, FISH | 14 |
| 12673 | 9/23/2002 | 98003 | NUMBER OF SPECIES, FISH | 15 |
| 12673 | 9/23/2002 | 98004 | TOTAL NUMBER OF DARTER SPECIES | 1 |
| 12677 | 9/23/2002 | 98004 | TOTAL NUMBER OF DARTER SPECIES | 2 |
| 12673 | 9/23/2002 | 98008 | TOTAL NUMBER OF SUNFISH SPECIES | 6 |
| 12677 | 9/23/2002 | 98008 | TOTAL NUMBER OF SUNFISH SPECIES | 6 |
| 12677 | 9/23/2002 | 98009 | TOTAL NUMBER OF SUCKER SPECIES | 0 |
| 12673 | 9/23/2002 | 98009 | TOTAL NUMBER OF SUCKER SPECIES | 0 |
| 12677 | 9/23/2002 | 98010 | TOTAL NUMBER OF INTOLERANT SPECIES, FISH | 1 |
| 12673 | 9/23/2002 | 98010 | TOTAL NUMBER OF INTOLERANT SPECIES, FISH | 1 |
| 12677 | 9/23/2002 | 98016 | PERCENT OF INDIVIDUALS AS TOLERANTS, FISH | 34 |
| 12673 | 9/23/2002 | 98016 | PERCENT OF INDIVIDUALS AS TOLERANTS, FISH | 15.35 |
| 12677 | 9/23/2002 | 98017 | PERCENT OF INDIVIDUALS AS OMNIVORES, FISH | 0.01 |
| 12673 | 9/23/2002 | 98017 | PERCENT OF INDIVIDUALS AS OMNIVORES, FISH | 0.01 |
| 12677 | 9/23/2002 | 98021 | PERCENT OF INDIVIDUALS AS INSECTIVORES, FISH | 83 |
| 12673 | 9/23/2002 | 98021 | PERCENT OF INDIVIDUALS AS INSECTIVORES, FISH | 88 |
| 12677 | 9/23/2002 | 98022 | PERCENT OF INDIVIDUALS AS PISCIVORES, FISH | 6 |
| 12673 | 9/23/2002 | 98022 | PERCENT OF INDIVIDUALS AS PISCIVORES, FISH | 3 |
| 12677 | 9/23/2002 | 98023 | TOTAL NUMBER OF INDIVIDUALS IN SAMPLE, FISH | 507 |
| 12673 | 9/23/2002 | 98023 | TOTAL NUMBER OF INDIVIDUALS IN SAMPLE, FISH | 241 |
| 12677 | 9/23/2002 | 98024 | PERCENT OF INDIVIDUALS AS HYBRIDS | 0 |
| 12673 | 9/23/2002 | 98024 | PERCENT OF INDIVIDUALS AS HYBRIDS | 0 |
| 12677 | 9/23/2002 | 98024 | PERCENT OF INDIVIDUALS AS HYBRIDS | 0 |
| 12673 | 9/23/2002 | 98024 | PERCENT OF INDIVIDUALS AS HYBRIDS | 0 |
| 12677 | 9/23/2002 | 98030 | PERCENT OF INDIVIDUALS WITH DISEASE OR ANOMALY | 0.01 |
| 12673 | 9/23/2002 | 98030 | PERCENT OF INDIVIDUALS WITH DISEASE OR ANOMALY | 0 |
| 12677 | 9/24/2002 | 00010 | TEMPERATURE, WATER (DEGREES CENTIGRADE) | 20.85 |
| 12677 | 10/10/2002 | 00010 | TEMPERATURE, WATER (DEGREES CENTIGRADE) | 21.05 |
| 12677 | 8/8/2002 | 00010 | TEMPERATURE, WATER (DEGREES CENTIGRADE) | 21.67 |
| 12673 | 10/10/2002 | 00010 | TEMPERATURE, WATER (DEGREES CENTIGRADE) | 22.08 |
| 12673 | 9/24/2002 | 00010 | TEMPERATURE, WATER (DEGREES CENTIGRADE) | 21.8 |
| 12673 | 8/8/2002 | 00010 | TEMPERATURE, WATER (DEGREES CENTIGRADE) | 24.98 |
| 12673 | 9/19/2002 | 00010 | TEMPERATURE, WATER (DEGREES CENTIGRADE) | 24.19 |
| 12677 | 9/19/2002 | 00010 | TEMPERATURE, WATER (DEGREES CENTIGRADE) | 21.52 |
| 12673 | 9/19/2002 | 00061 | FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC) | 9.86 |
| 12677 | 8/8/2002 | 00061 | FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC) | 20.5 |
| 12673 | 8/8/2002 | 00061 | FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC) | 13.69 |
| 12677 | 9/24/2002 | 00061 | FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC) | 13.72 |
| 12673 | 9/24/2002 | 00061 | FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC) | 17.09 |
| 12673 | 10/10/2002 | 00061 | FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC) | 41.93 |
| 12677 | 10/10/2002 | 00061 | FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC) | 35.04 |
| 12677 | 9/19/2002 | 00061 | FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC) | 9.56 |
| 12673 | 9/24/2002 | 00078 | TRANSPARENCY, SECCHI DISC (METERS) | 0.33 |
| 12677 | 8/8/2002 | 00078 | TRANSPARENCY, SECCHI DISC (METERS) | > 1 |
| 12677 | 10/10/2002 | 00078 | TRANSPARENCY, SECCHI DISC (METERS) | > 1 |
| 12673 | 10/10/2002 | 00078 | TRANSPARENCY, SECCHI DISC (METERS) | > 1 |
| 12677 | 9/19/2002 | 00078 | TRANSPARENCY, SECCHI DISC (METERS) | > 0.3 |
| 12677 | 10/10/2002 | 00094 | SPECIFIC CONDUCTANCE, FIELD (UMHOS/CM @ 25C) | 511 |

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|-------|------------|-------|---|----------|
| 12677 | 9/24/2002 | 00094 | SPECIFIC CONDUCTANCE, FIELD (UMHOS/CM @ 25C) | 567 |
| 12673 | 8/8/2002 | 00094 | SPECIFIC CONDUCTANCE, FIELD (UMHOS/CM @ 25C) | 439 |
| 12673 | 10/10/2002 | 00094 | SPECIFIC CONDUCTANCE, FIELD (UMHOS/CM @ 25C) | 386 |
| 12673 | 9/19/2002 | 00094 | SPECIFIC CONDUCTANCE, FIELD (UMHOS/CM @ 25C) | 503 |
| 12677 | 9/19/2002 | 00094 | SPECIFIC CONDUCTANCE, FIELD (UMHOS/CM @ 25C) | 586 |
| 12673 | 8/8/2002 | 00300 | OXYGEN, DISSOLVED (MG/L) | 7.87 |
| 12677 | 9/24/2002 | 00300 | OXYGEN, DISSOLVED (MG/L) | 7.4 |
| 12673 | 9/24/2002 | 00300 | OXYGEN, DISSOLVED (MG/L) | 8.4 |
| 12673 | 10/10/2002 | 00300 | OXYGEN, DISSOLVED (MG/L) | 8 |
| 12677 | 10/10/2002 | 00300 | OXYGEN, DISSOLVED (MG/L) | 6.6 |
| 12677 | 8/8/2002 | 00300 | OXYGEN, DISSOLVED (MG/L) | 6.95 |
| 12673 | 9/19/2002 | 00300 | OXYGEN, DISSOLVED (MG/L) | 7.44 |
| 12677 | 8/8/2002 | 00307 | BIOCHEM OXY DEM, INHIB, DISS (MG/L, 5DAY-20C, CBOD) | < 2 |
| 12677 | 9/24/2002 | 00307 | BIOCHEM OXY DEM, INHIB, DISS (MG/L, 5DAY-20C, CBOD) | < 2 |
| 12673 | 8/8/2002 | 00307 | BIOCHEM OXY DEM, INHIB, DISS (MG/L, 5DAY-20C, CBOD) | < 2 |
| 12673 | 9/24/2002 | 00307 | BIOCHEM OXY DEM, INHIB, DISS (MG/L, 5DAY-20C, CBOD) | < 2 |
| 12673 | 9/19/2002 | 00400 | PH (STANDARD UNITS) | 7.73 |
| 12677 | 8/8/2002 | 00400 | PH (STANDARD UNITS) | 7.14 |
| 12673 | 8/8/2002 | 00400 | PH (STANDARD UNITS) | 7.85 |
| 12677 | 9/24/2002 | 00400 | PH (STANDARD UNITS) | 7.33 |
| 12677 | 10/10/2002 | 00400 | PH (STANDARD UNITS) | 6.76 |
| 12673 | 10/10/2002 | 00400 | PH (STANDARD UNITS) | 8.06 |
| 12677 | 9/19/2002 | 00400 | PH (STANDARD UNITS) | 7.26 |
| 12673 | 9/24/2002 | 00400 | PH (STANDARD UNITS) | 7.85 |
| 12673 | 9/24/2002 | 00410 | ALKALINITY, TOTAL (MG/L AS CaCO3) | 207.42 |
| 12677 | 8/8/2002 | 00410 | ALKALINITY, TOTAL (MG/L AS CaCO3) | 284 |
| 12677 | 9/19/2002 | 00410 | ALKALINITY, TOTAL (MG/L AS CaCO3) | 237.15 |
| 12677 | 10/10/2002 | 00410 | ALKALINITY, TOTAL (MG/L AS CaCO3) | 260 |
| 12673 | 10/10/2002 | 00410 | ALKALINITY, TOTAL (MG/L AS CaCO3) | 199 |
| 12673 | 9/19/2002 | 00410 | ALKALINITY, TOTAL (MG/L AS CaCO3) | 207.1 |
| 12673 | 8/8/2002 | 00410 | ALKALINITY, TOTAL (MG/L AS CaCO3) | 260 |
| 12677 | 9/24/2002 | 00410 | ALKALINITY, TOTAL (MG/L AS CaCO3) | 228.31 |
| 12677 | 10/10/2002 | 00610 | NITROGEN, AMMONIA, TOTAL (MG/L AS N) | 0.066 |
| 12677 | 8/8/2002 | 00610 | NITROGEN, AMMONIA, TOTAL (MG/L AS N) | < 0.1 |
| 12673 | 8/8/2002 | 00610 | NITROGEN, AMMONIA, TOTAL (MG/L AS N) | < 0.1 |
| 12673 | 10/10/2002 | 00610 | NITROGEN, AMMONIA, TOTAL (MG/L AS N) | 0.055 |
| 12677 | 8/8/2002 | 00625 | NITROGEN, KJELDAHL, TOTAL (MG/L AS N) | < 0.5 |
| 12673 | 8/8/2002 | 00625 | NITROGEN, KJELDAHL, TOTAL (MG/L AS N) | < 0.5 |
| 12677 | 10/10/2002 | 00625 | NITROGEN, KJELDAHL, TOTAL (MG/L AS N) | 0.316 |
| 12673 | 10/10/2002 | 00625 | NITROGEN, KJELDAHL, TOTAL (MG/L AS N) | < 0.2 |
| 12673 | 10/10/2002 | 00631 | NITRITE PLUS NITRATE, DISS 1 DET. (MG/L AS N) | 0.355 |
| 12677 | 8/8/2002 | 00631 | NITRITE PLUS NITRATE, DISS 1 DET. (MG/L AS N) | < 0.2 |
| 12677 | 10/10/2002 | 00631 | NITRITE PLUS NITRATE, DISS 1 DET. (MG/L AS N) | 0.648 |
| 12673 | 8/8/2002 | 00631 | NITRITE PLUS NITRATE, DISS 1 DET. (MG/L AS N) | < 0.2 |
| 12673 | 8/8/2002 | 00665 | PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P) | < 0.1 |
| 12677 | 10/10/2002 | 00665 | PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P) | < 0.06 |
| 12677 | 8/8/2002 | 00665 | PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P) | < 0.1 |
| 12673 | 10/10/2002 | 00665 | PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P) | < 0.06 |
| 12673 | 8/8/2002 | 00671 | PHOSPHORUS, DISSOLVED ORTHOPHOSPHORUS (MG/L AS P) | < 0.1 |
| 12677 | 10/10/2002 | 00671 | PHOSPHORUS, DISSOLVED ORTHOPHOSPHORUS (MG/L AS P) | < 0.04 |
| 12677 | 8/8/2002 | 00671 | PHOSPHORUS, DISSOLVED ORTHOPHOSPHORUS (MG/L AS P) | < 0.1 |
| 12673 | 10/10/2002 | 00671 | PHOSPHORUS, DISSOLVED ORTHOPHOSPHORUS (MG/L AS P) | < 0.04 |
| 12677 | 9/19/2002 | 00680 | CARBON, TOTAL ORGANIC (MG/L AS C) | < 1 |
| 12673 | 8/8/2002 | 00680 | CARBON, TOTAL ORGANIC (MG/L AS C) | 1.55 |
| 12673 | 9/24/2002 | 00680 | CARBON, TOTAL ORGANIC (MG/L AS C) | 4.23 |
| 12673 | 10/10/2002 | 00680 | CARBON, TOTAL ORGANIC (MG/L AS C) | 2.536667 |
| 12677 | 8/8/2002 | 00680 | CARBON, TOTAL ORGANIC (MG/L AS C) | 4.56 |
| 12677 | 10/10/2002 | 00680 | CARBON, TOTAL ORGANIC (MG/L AS C) | 1.233333 |
| 12673 | 9/23/2002 | 00800 | | 1 |
| 12677 | 9/23/2002 | 00800 | | 1 |
| 12673 | 9/23/2002 | 00812 | Statewide criteria IBI Score | Hgh 48 |
| 12677 | 9/23/2002 | 00812 | Statewide criteria IBI Score | Hgh 48 |
| 12673 | 9/23/2002 | 00813 | Number of native cyprinid species | 2 |
| 12677 | 9/23/2002 | 00813 | Number of native cyprinid species | 3 |
| 12677 | 9/23/2002 | 89906 | NUMBER OF INDIV. IN BENTHIC RBA SUBSAMPLE (#IND) | 124 |
| 12673 | 9/23/2002 | 89906 | NUMBER OF INDIV. IN BENTHIC RBA SUBSAMPLE (#IND) | 70 |
| 12673 | 9/23/2002 | 89941 | NET LENGTH (METERS) | 5.49 |
| 12677 | 9/23/2002 | 89941 | NET LENGTH (METERS) | 5.49 |
| 12673 | 9/23/2002 | 89943 | ELECTROFISHING METHOD 1BOAT2BACKPACK3TOTE BARGE | 2 |
| 12677 | 9/23/2002 | 89943 | ELECTROFISHING METHOD 1BOAT2BACKPACK3TOTE BARGE | 2 |
| 12677 | 9/23/2002 | 89944 | ELECTROFISH EFFORT, DURATION OF SHOCKING (SEC) | > 900 |
| 12673 | 9/23/2002 | 89944 | ELECTROFISH EFFORT, DURATION OF SHOCKING (SEC) | > 900 |
| 12673 | 9/23/2002 | 89946 | MESH SIZE, ANY NET OR SIEVE, AVERAGE BAR (CM) | 0.3175 |
| 12677 | 9/23/2002 | 89946 | MESH SIZE, ANY NET OR SIEVE, AVERAGE BAR (CM) | 0.3175 |
| 12677 | 9/23/2002 | 89948 | COMBINED LENGTH OF SEINE HAULS (METERS) | 60 |
| 12673 | 9/23/2002 | 89948 | COMBINED LENGTH OF SEINE HAULS (METERS) | 60 |