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Contact Recreation Use Attainability Analysis Pilot Study for Mill Creek Austin County, Texas

PREPARED IN COOPERATION WITH THE HOUSTON-GALVESTON AREA COUNCIL, THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY

Prepared by

PBS

AUGUST 2007

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PBS&J Project No. 461409.00 Document No. 07H033

FINAL REPORT CONTACT RECREATION USE ATTAINABILITY ANALYSIS PILOT STUDY FOR MILL CREEK, AUSTIN COUNTY, TEXAS HOUSTON-GALVESTON AREA COUNCIL

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August 2007

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Acronyms and Abbreviations

ADP	antecedent dry period
ADV	Acoustic Doppler Velocimeter
С	Celsius
cfs	cubic feet per second
CV	Coefficient of Variation
DEM	Digital Elevation Model
DO	dissolved oxygen
E. coli	Escherichia coli
EPA	Environmental Protection Agency
FGDC	Federal Geographic Data Committee
FM	Farm-to-Market Road
ft/s	feet/foot per second
GIS	Geographic Information System
gpd	gallons per day
GPS	Global Positioning System
HCFCD	Harris County Flood Control District
HCOEM	Harris County Office of Emergency Management
H-GAC	Houston-Galveston Area Council
HQI	Habitat Quality Index
km	kilometer(s)
LULC	Land Use/Land Cover
mgd	million gallons per day
mg/L	milligram per liter
mL	milliliters
MPN	most probable number
mS/cm	milliSiemens per centimeter
Ν	number of samples
NH ₄ -N	ammonia nitrogen
QAPP	Quality Assurance Project Plan
SE	standard error
SH	State Highway
SLOC	site location
SSI	Swimming Suitability Index
SWQM	Surface Water Quality Monitoring
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TKN	total kjeldahl nitrogen



TN	total nitrogen	
TP	total phosphorus	
TSS	total suspended solids	
UAA	use attainability analysis	
USGS	United States Geological Survey	
VSS	volatile suspended solids	
WQA	water quality assessment	
WWTP	Waste Water Treatment Plant	
YSI	Yellow Springs Instruments, Inc.	

1.1 PURPOSE

On May 17, 2007, the Houston Galveston Area Council ("H-GAC") retained PBS&J to provide environmental consulting services to assist with H-GAC's pilot study of contact recreation use attainability analysis ("UAA") methods ("the pilot study"). On May 17, 2007, H-GAC authorized PBS&J to initiate field and office coordination for the pilot study. Field preparation and reconnaissance took place on May 24 and 28 and June 4, 2007. The habitat assessment was conducted from July 9 through 13, 2007. Wet and dry weather sampling took place over nine weeks on June 13, 22, and 28, and on July 11, 24, and 31, 2007. The draft report was delivered to H-GAC on July 27, 2007. This document serves as the final report, which describes the study area, the methods used, the results obtained, and the study recommendations. The pilot study is part of a larger project being conducted by H-GAC to determine what is needed to launch a state-wide plan for conducting UAA's.

1.2 BACKGROUND AND GOALS

The Texas Commission on Environmental Quality ("TCEQ") is responsible for establishing surface water quality standards for all waters in the state, under the authority of Section 303(c) of the Clean Water Act and Section 26.023 of the Texas Water Code. Texas Surface Water Quality Standards are found in Title 30, Chapter 307, of the Texas Administrative Code ("TAC"). The standards establish explicit water quality goals throughout the state. The standards are to maintain the quality of water in the state of Texas consistent with public health and enjoyment, protection of aquatic life, and the operation of existing industries and economic development of the state.

Each standard consists of a designated use, a criterion to protect that use, and an anti-degradation policy. For example, to maintain the contact recreation use in fresh water, 30 TAC §307.7(b)(1)(A)(i) states that "the geometric mean of *Escherichia coli* (*E. coli*) should not exceed 126 per 100 milliliters ["mL"]." In addition, single samples of *E. coli* should not exceed 394 per 100 mL.

Federal regulations allow designated uses to be altered or adjusted if they are found not to be appropriate (existing and attainable) using a process called a UAA. See Part 131.10(g) of Title 40 of the Code of Federal Regulations (40 CFR 131.10(g)). The regulations set forth six criteria for removing a designated use if a UAA can demonstrate that attainment is impossible because:

- 1. Naturally occurring pollutant concentrations prevent the attainment of the use.
- 2. Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of



sufficient volume of effluent discharges without violating state water conservation requirements to enable uses to be met.

- 3. Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place.
- 4. Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the use.
- 5. Physical conditions related to the natural features of the waterbody, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses.
- 6. Controls more stringent than those required by Sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.

When conducting a UAA, generally defined by Environmental Protection Agency ("EPA") as a structured scientific assessment of the factors affecting the attainment of uses specified in Section 101(a)(2) of the Clean Water Act (the so called "fishable/swimmable" uses), one of the six factors must be adequately demonstrated. Demonstration of the UAA factors generally requires some field sampling and observation of the water body of interest. This study was conducted to assist H-GAC and TCEQ with development of protocols to conduct recreational UAA's in the future. This report provides the results of a study conducted to:

- Evaluate methods for watershed reconnaissance for regional or statewide use.
- Evaluate the appropriateness of various methods of characterizing bacteria concentrations in a rural freshwater stream system under various hydrologic influences.
- Evaluate the appropriateness of documenting physical stream conditions for recreational use using habitat assessment techniques.
- Evaluate the appropriateness of documenting current recreational uses via interviews and questionnaires.

1.3 ORGANIZATION OF DOCUMENT

This document is organized into six sections as follows:

- Section 1 Introduction: Section 1.0 provides the background, purpose of the project, and study area details.
- Section 2 Study Area: Section 2.0 provides information about the study area and describes the location of the three sampling locations used in the pilot study.

- Section 3 Methods: Section 3.0 describes the methods applied for the watershed reconnaissance, habitat assessment, wet and dry weather sampling, and recreational suitability in developing a draft UAA protocol.
- Section 4 Results: Section 4.0 discusses the findings of the watershed reconnaissance, habitat assessment, analytical results for wet and dry weather sampling, and the recreational suitability draft UAA protocol.
- Section 5 Conclusions: Section 5.0 discusses recommendations for further consideration with respect to the methods used during the watershed reconnaissance, bacterial density and water quality measurements, habitat assessment, and contact recreation interviews.
- Section 6 References: Section 6.0 provides a comprehensive list of references cited in this report.

2.0 STUDY AREA

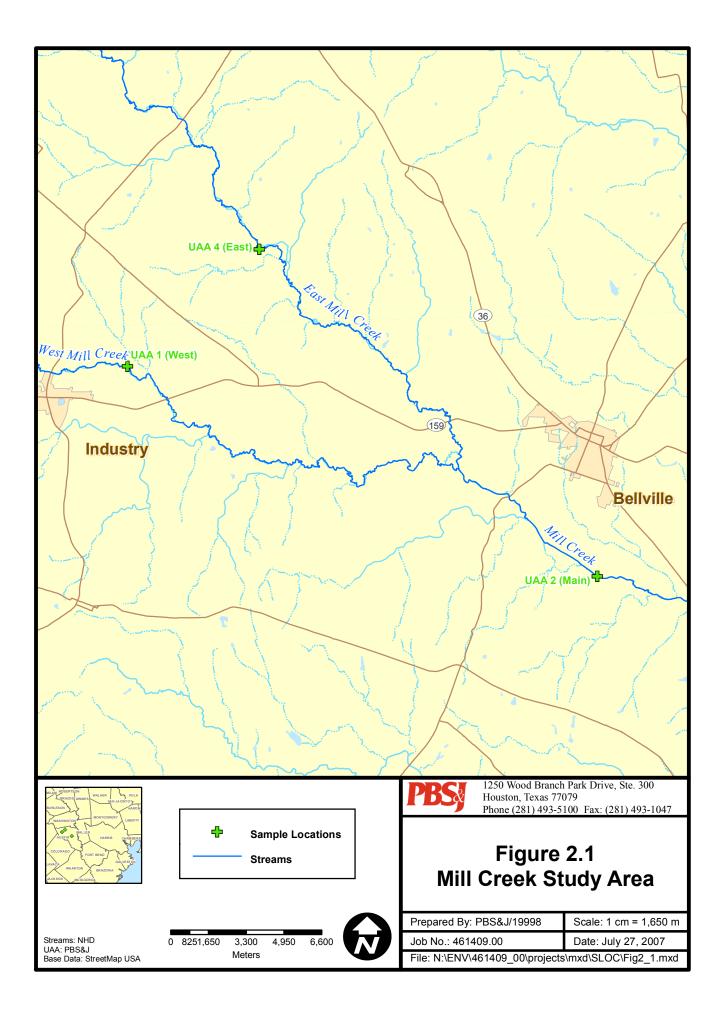
Mill Creek is formed by two branches, the "East Fork," also known as East Fork Mill Creek, and the West Fork in Washington County, Texas. The two branches unite to form Mill Creek in central Austin County, Texas (at 29°56' N, 96°19' W). The main stream flows southeast for 14 miles to its mouth on the Brazos River, on the Austin-Waller county line 2 miles north of Stephen F. Austin State Park (at 29°50' N, 96°07' W) (University of Texas, 2007). The main stem serves a drainage area of 376 square miles (United States Geological Survey ["USGS"] Station 08111700 Mill Creek near Bellville, Texas) and travels through level to moderately sloping terrain surfaced with clay that supports grasslands and post oak forest (University of Texas, 2007). For a more detailed description of the study area see Section 4.1, Watershed Reconnaissance.

2.1 SAMPLE SITES

Three sites, one each on the East and West Forks and one on the main stem of Mill Creek, within Austin County, were selected for the pilot study as follows:

- UAA1 (West Fork): West Fork of Mill Creek at the Intersection of Industry Road and Bluehole Road, 2.1 miles downstream of Farm-to-Market Road ("FM") 109.
- UAA2 (Main Stem): Mill Creek at FM 2429, 3.2 miles upstream of State Highway ("SH") 36 and 3.3 miles downstream of Mill Creek Road, and 3.6 miles south of the City of Bellville.
- UAA4 (East Fork): East Fork of Mill Creek at Mikeska Road, 3.6 miles north of the intersection of SH 159 and SH 2502.

The selected sites within the study area are illustrated in Figure 2-1 below. One alternate site was selected on the main stem of Mill Creek (UAA3), but was not used because UAA2 had a higher likelihood of observing contact recreation activities.



3.0 METHODS

Prior to commencement of field surveys for the pilot study, TCEQ issued Quality Assurance Project Plan ("QAPP") to H-GAC and PBS&J. The QAPP is dated May 7, 2007, approximately 37 days before the scheduled start of field work. Below is a detailed description of the field work conducted under the QAPP. Any significant deviations from the approved QAPP are noted in this report.

3.1 WATERSHED RECONNAISSANCE

PBS&J staff conducted a field reconnaissance of the Mill Creek watershed. The purpose of the watershed reconnaissance survey was to identify:

- Three sample locations for wet and dry weather sampling and habitat assessment
- Potential sources of bacteria
- Areas of obvious human recreational use
- Impediments to contact recreation

Staff used a combination of field surveys and desktop analysis to gather information about the Mill Creek watershed and input these data into a Geographical Information System ("GIS") format to create a watershed reconnaissance map. The majority of the field reconnaissance was conducted on foot and by vehicle; however, kayaks were used for a small portion of the creek just upstream of the Main Stem site (UAA2). Data used for the desktop analysis was provided by H-GAC and included true color aerial photography from 2005, Digital Elevation Models ("DEM"), Land Use/Land Cover ("LULC") data from 2005, and various ESRI ArcGIS shapefiles such as flowlines, outfalls, cemeteries, airports, county roads, and city boundaries.

The field reconnaissance surveys were documented using a digital camera and global positioning system ("GPS") device. During reconnaissance, the following items were noted for inclusion on the watershed map:

- Point source discharges
- Land use (significant animal populations)
- Illegal dumping areas
- Habitat types (public lands or parks near the water body)

- Signs of human use
- Nearby developed areas

The project team selected three sampling locations and one alternate within the Mill Creek Watershed that were most suitable for conducting the pilot study. Special consideration was given to finding sites that have the highest probability of being utilized for contact recreation. The recommended sites were provided to H-GAC electronically with a location description for review using the TCEQ site location ("SLOC") form.

The watershed reconnaissance maps were created by converting GPS data into a GIS format. Each data point, corresponding identification, and data classification fields were added to generate an inventory of attributes. All ESRI ArcView shapefiles were projected to Texas State Plane, NAD83, South-Central Zone with units in feet, including corresponding Federal Geographic Data Committee ("FGDC") metadata generated for each file. FGDC metadata are used to describe each dataset's accuracy, coordinate information, field names and descriptions, and all other description categories pertinent to the data. The FDGC format was standardized by the federal government and is widely accepted in all GIS data management circles.

3.2 HABITAT ASSESSMENT

3.2.1 Habitat Characterization

A habitat assessment was completed for each site, paying special attention to the surrounding riparian zone using methods and equipment as outlined in the November 2006 *Surface Water Quality Monitoring* ("SWQM") *Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data* (TCEQ, 2006). Stream habitat parameters collected in the field (Part I of SWQM Procedures), along with other resources, were used to formulate the reach habitat descriptors (Part II of SWQM Procedures) listed below and described in the following paragraphs.

- Streambed slope
- Drainage area
- Average stream width and depth
- Instantaneous stream flow
- Maximum pool width and depth
- Number and definition of stream bends
- Habitat type (geomorphic unit) and number of riffles

- Average stream bank erosion potential
- Average stream bank angle
- Ecoregion
- Average tree canopy coverage
- Aesthetics
- Stream Order
- Average width of natural riparian vegetation and percentage of each vegetation type



- Dominant substrate type and percent gravel or larger
- Land development impact

• Instream cover

• Channel flow status

A Habitat Quality Index ("HQI") was calculated and a new parameter termed the Swimming Suitability Index ("SSI"), was developed based on the results from the field survey. During assessment activities, stream flow was measured concurrently with depth measurements using a Flow Tracker Acoustic Doppler Velocimeter ("ADV") and photos were taken at each transect from mid-channel facing upstream and downstream, and facing the left bank and the right bank. The resulting HQI (Part III of the SWQM Procedures) and SSI are addressed in Section 4.2 of this report.

3.2.1.1 Riparian Zone

The riparian zone assessment included the following measurements/assessments:

- Width of the natural vegetation buffer
- Types of riparian vegetation and percent coverage
- Percent tree canopy cover
- Aesthetic quality/land development impact

For each of the three reaches, the width of the natural vegetation buffer on the left and right banks of each transect was visually estimated (high bank height and steepness precluded physical measurement) then the minimum buffer widths for each transect within the reach were averaged.

In the riparian zone along the left and right banks within each reach, the types of riparian vegetation (i.e., trees, shrubs, grasses, cultivated fields, other) and percent coverage of each type were recorded. Subsequently, the percent of each vegetation type for both banks was averaged.

Percent tree canopy cover along each transect was measured using a convex densiometer, then all transect percentages were averaged. Four measurements were taken along each transect; two from mid-channel facing the left, then the right banks; and one each from the water's edge along and facing the left bank and along and facing the right bank.

Aesthetics were described using the SWQM Procedures, using the following categories, which are dependent on land development impacts: (1) Wilderness, (2) Natural Area, (3) Common Setting, and (4) Offensive.

3.2.2 Stream Physical Characteristics

Stream physical characteristic measurements included:

- Habitat type (geomorphic unit)
- Instream cover
- Channel flow
- Substrate characteristics
- Stream depth and width
- Aquatic vegetation
- Bank slope and erosion potential

The habitat type within each transect was identified as riffle, run, glide, or pool. Also, the number of riffles in each reach was recorded. Along each transect, instream physical structures such as logs, tree stumps, and gravel or larger-size substrate that provides shelter for fish and benthic macroinvertebrates were recorded if at a water depth suitable for use by aquatic organisms. Percentage stream cover was visually estimated and each cover type was recorded.

3.2.2.1 Stream Morphology

Channel flow status was determined based on the amount (percentage) of available channel substrate, from bank to bank, covered by water. The number of stream bends and stream bend types (i.e., well defined, moderately defined, poorly defined) within each reach were recorded.

3.2.2.2 Substrate

The dominant substrate type was determined along each transect based on particle size, and percent gravel or larger (>2 millimeters, 0.08 inch) was recorded.

3.2.2.3 Aquatic Vegetation

Any aquatic vegetation observed during the assessment was noted.

3.2.2.4 Stream Depth

Along each transect, average stream width from water's edge to water's edge was measured. Also, the width and depth of the largest pool encountered in each reach were measured.

3.2.2.5 Stream Width

Along each transect, average stream depth from water surface to channel bottom was measured.

3.2.2.6 Bank Slope

The angle of the left and right banks of each transect was measured in degrees with a clinometer. Special measuring guidelines were used, per the SWQM Procedures, for low flow conditions, vertical banks, undercut banks, and irregularly-shaped banks. Concurrently, the percentage of stream bank showing evidence of or potential for erosion was visually estimated for each bank up to the first terrace, then averaged for percent erosion potential across the reach.

3.3 WET AND DRY WEATHER SAMPLING

Wet and dry weather field sampling for the pilot study was conducted in accordance with the most recent version of the TCEQ SWQM manual and the Water Quality Assessment ("WQA") Programs approved QAPP specified for the pilot study. When deviations from the protocols above occurred, it is stated as such in the below detailed sections.

The intent of this pilot study was to evaluate various sampling methods. Ideally, sampling efforts should occur during the index period between March 15 to October 15 so that dry weather samples are taken during base flow conditions. This timeframe reflects the greatest potential for contact recreation to be occurring. In order to obtain the most representative analytical results possible, sampling occurred during the critical period, which in Texas is defined as July 1 through September 30. It is during this period that base flow conditions are **expected** to occur. According to *Contact Recreation Use Attainability Analyses: Draft Protocols for Collection of Field Data* ("Draft Protocols") (H-GAC, 2007), base flow is that portion of a stream's flow contributed by sources of water other than precipitation runoff. It should be noted, however, that collecting samples outside of the index period allows for sampling during low flow conditions may not occur. This project focused on six sampling events that occurred during June through August 2007.

As described in the Draft Protocols (H-GAC, 2007) and the *Mill Creek Source Identification Study Scope of Work*, wet weather sampling should occur when the site experienced a 10-day antecedent dry period ("ADP") where no measurable rainfall occurred, followed by a storm that resulted in a minimum of 1 inch of rainfall. Sampling should begin as close to the beginning of the runoff as possible. Safety constraints required that wet weather sampling occur only during daylight hours on weekdays and weekends. Rainfall data were noted on a daily basis during the pilot study and more frequently when storm events were forecasted. From this dataset, rainfall data were recorded for 10 days preceding any sampling event. Discharge, gauge height, and precipitation from the USGS station (#0811179) were also recorded daily throughout the study period. Based on weather conditions during the study period, a third sampling



category was necessary to describe sample events that occurred after some rain events but that did not meet the qualification of wet weather sampling. "Post-rainfall" sampling was conducted on days following a significant rainfall event but after the creek was allowed to return to somewhat normal flow conditions. Somewhat normal flow conditions were defined to be present at the three sample sites 24 hours after the rain event and when the stream depth at the USGS station downstream of all sample sites was less than 5 feet.

3.3.1 Physical, Hydrological Chemical, and Microbial Characteristics

Data was collected at each of the three sites for physical, hydrological, chemical, and microbial characterization. A summary of the collection techniques used to collect bacteria samples for each sample event are summarized in Table 3-1 below. Basic water quality parameters of dissolved oxygen ("DO"), water temperature, specific conductivity, and pH were collected using either a Yellow Springs Instruments, Inc. ("YSI") Model 600 XLM or Model 6920 V2. A secchi disk was used to measure water clarity in the field. The secchi disk was lowered until it could not be seen, then raised so the black and white fields were barely visible. This depth was noted on the field data sheet. If water clarity was such that the secchi disk reached to the streambed and could still be seen, water clarity was recorded as greater than the water depth. Stream flow was measured by the transect method at each site using a Sontek Doppler Velocimeter or a Marsh McBirney flow meter. Velocity readings were taken at either 11 or 20 evenly-spaced intervals during the first three sample events as there was some disagreement between TCEQ's SWQM protocol and the UAA Draft Protocol. It was then decided that 11 measurements were adequate for streams less than 20 feet across for this study, and therefore 11 measurements were taken at sites UAA1 and UAA4 for Sample Events 4, 5, and 6. Instantaneous water velocity readings were collected at the time and location corresponding to each bacteria grab sample as well.

Sample Event No.	<u>E. coli</u> Sampling Method: Description	
1	Time Series: 5-minute intervals for one hour	
2	Cross Section: 5 equally-spaced samples perpendicular to the flow	
3	Longitudinal: 5 equally-spaced samples	
4	Vertical: surface, middle, and bottom	
5	Time Series: 5-minute intervals for one hour	
6	Vertical: surface, middle, and bottom	

 Table 3-1

 Bacteria Sample Methodology for Mill Creek UAA Sample Locations

Water samples were collected for laboratory analysis of:

- Total Suspended Solids ("TSS")
- Volatile Suspended Solids ("VSS")
- Total Phosphorus ("TP")
- Total Nitrogen ("TN")
- Total Kjeldahl Nitrogen ("TKN")

- Ammonia-Nitrogen ("NH4-N")
- Nitrates-Nitrites
- E. coli

One duplicate was collected for every 10 samples collected. Bacteria grab samples were collected in a different manner for four of the six sample events as noted in Table 3-1 above.

During Event 1 and Event 5, *E. coli* grab samples were collected according to a time series in which samples were collected every 5 minutes for a total of 60 minutes. During Events 1 and 5, samples were taken from 1 foot below the water's surface. During this period, quality control samples were collected. Sample duplicates were collected from each site. One duplicate was collected for every 10 bacteria samples collected.

For Event 2, bacteria samples were collected perpendicular to stream flow at evenly-spaced intervals along the width of the stream just below the surface of the water. Five samples were collected simultaneously from the left bank, 25 percent, mid-stream, 75 percent, and right bank locations across the stream width. This was completed at the West Fork and East Fork sites by affixing the sample bottles to a piece of metal with holes drilled into it. Holes were to allow water to easily pass through the device without bending and to accommodate placing samples at the location across the stream described above at sites with varying stream widths (Figure 3-1). The stream width at Main Stem site (UAA2) was too wide to use this device, so field team members entered the stream at the locations described above and manually collected samples from 1 foot below the water's surface. During this period, quality control samples were collected. Sample duplicates were collected from each site.



Figure 3-1 Picture Describing Sampling Techniques Used on the East Fork (UAA4) and West Fork (UAA1) Sites During Cross-Section Method for Collecting *E. coli* Samples

During Event 3, bacteria samples were collected longitudinally along the total reach of the stream that was assessed for each site. Samples were taken from 1 foot depth at evenly-spaced intervals. Sample locations were spaced 40 meters (131.2 feet) for the East Fork and West Fork, and 250 meters (820 feet) for the Main Stem site. *E. coli* samples were collected manually from the downstream to upstream by placing field team members at each location on the bank creek. Once the sample downstream was collected, the sampler radioed to the next sampler to collect the next *E. coli* sample. At the Main Stem site (UAA2), kayaks were used because the stream was too deep to wade (Figure 3-2). All other parameters were collected at the downstream location of the reach. During this period, quality control samples were collected. Sample duplicates were collected from each site.





Figure 3-2 Picture Describing Sampling Techniques Used on the Main Stem Site (UAA2) During Longitudinal Method for Collecting *E. coli* Samples

For Event 4 and Event 6, bacteria samples were collected vertically throughout the water column at the centroid of the flow. Sample depths were approximately 1 foot from the bottom, mid-depth, and 1 foot below the surface. During this period, quality control samples were collected. One sample duplicate was collected during this sample event.

3.3.2 Statistical Analysis

3.3.2.1 Methodology Analysis

Boxplots were created to determine if the first grab sample for *E. coli* was different from subsequent samples collected at that sample site for that sample event. The one-sample t-test was performed using the null hypothesis μ =0.05. This test was done to determine if statistical differences existed between the first grab sample and geometric mean of samples collected at a single site during one event (Figure 3-3).

The main purpose of the bacteria analysis was to determine whether a single grab sample is sufficient to capture bacteria concentrations in Mill Creek. Several additional comparisons between *E. coli* concentrations and various stream characteristics (flow, velocity, stream depth, and sample depth) were explored to determine if the limited dataset gathered during the pilot study showed evidence of a relationship or trends. The purpose of the results was to test different methods for collecting bacterial data and to show examples of the type of analysis needed when conducting a contact recreation UAA. The results from the additional comparisons and an explanation of the results are not presented in the results section. These data are located in the Appendix.



SPSS 14.0 (Statistical Package for Social Sciences, Chicago, IL) and Excel (Microsoft, Redmond, WA) were used to compute statistical analyses for the dataset. Descriptive statistics, including number of samples ("N"), median, mean, standard error, standard deviation, coefficient of variation ("CV"), minimum, and maximum were computed for all continuous variables. Geometric mean was computed instead of arithmetic mean for all *E. coli* data.

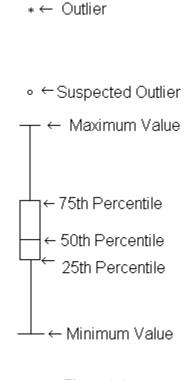


Figure 3-3 Boxplot Diagram

3.4 RECREATIONAL SUITABILITY

In order to determine the stream's suitability for swimming, PBS&J staff surveyed stream reaches, conducted interviews of stream users, and located areas of potential full-body contact recreation. Areas identified with the potential to physically support primary contact recreation activities (e.g., tubing, swimming) were revisited. During field visits, the field teams documented any uses observed and any indications of human use by noting evidence on field data sheets and taking digital photographs. PBS&J staff also conducted a sanitary survey of the area to determine potential sources of bacterial contamination.



PBS&J staff carried interview forms (Data Sheet D) with them during the field reconnaissance survey, the habitat assessment, and during each sampling event for wet and dry weather sampling to interview the public about contact recreation uses. This was to maximize the number of interview forms filled out during the course of the pilot study. To further supplement the contact recreation data collection, PBS&J staff met with local officials and townspeople/landowners in the towns of Bellville, Bleiblerville, and Industry who were knowledgeable about the current and historic uses of the Mill Creek watershed. During these meetings, PBS&J staff left several survey forms with each interviewee to pass out to friends and family who use Mill Creek for primary contact recreation purposes. These interviews were documented on Data Sheet D - Recreational Use Interview, which is included in the Draft Protocols (H-GAC, 2007) and are summarized in the results section.

4.0 RESULTS

4.1 WATERSHED RECONNAISSANCE

The watershed reconnaissance was conducted over three days, including May 24 and 28 and June 4, 2007. PBS&J staff conducted the reconnaissance survey on foot, by vehicle, and using a kayak. The below sections detail the findings from the watershed reconnaissance survey. Site locations, access points, areas of human use, and potential sources of bacteria were recorded during the watershed reconnaissance and are presented on the Watershed Map located in Appendix A. Representative photographs taken during the field survey are located in Appendix B.

Three site locations selected for the pilot study are located on the East and West Forks and one on the Main Stem of Mill Creek, within Austin County:

- UAA1 (West Fork): West Fork of Mill Creek at the Intersection of Industry Road and Bluehole Road, 2.1 miles downstream of FM 109
- UAA2 (Main Stem): Mill Creek at FM 2429, 3.2 miles upstream of SH 36 and 3.3 miles downstream of Mill Creek Road, and 3.6 miles south of the city of Bellville
- UAA4 (East Fork): East Fork of Mill Creek at Mikeska Road, 3.6 miles north of the intersection of SH 159 and SH 2502

4.1.1 Wastewater Discharges

The Mill Creek watershed contains two wastewater treatment plant ("WWTP") outfalls that discharge into various branches of the creek and two commercial outfalls. Two dischargers are municipal permitees and the third is Bellville Tube Co., LP. The City of Bellville WWTP, TCEQ Permit No. 10385-02, is located approximately 1 mile south-southwest of the intersection of SH 36 and SH 159 with FM 1456. The treatment plant serves approximately 4,000 people and discharges 0.045-0.047 million gallons per day ("mgd") or 0.07-0.073 cubic feet per second ("cfs") into Boggy Creek. Boggy Creek enters the main branch of Mill Creek east of SH 36 approximately 3 miles downstream of UAA2. The City of Industry is a municipal permitee that discharges into West Fork Mill Creek. The WWTP, TCEQ Permit No. 13897-001, serves about 200 people and discharges at a rate of 10,000 gallons per day ("gpd"). The discharge point is 2.1 miles west and upstream of UAA1. Two other outfalls are indicated on the TCEQ 2006 data that belong to Bellville Tube Co., LP. This outfall is located north of the intersection of Miller Road at SH 36. The Permit No. is 03716-000. All discharge locations are noted on the watershed reconnaissance map in Appendix A.



Neighborhoods that have developed in Bellville occur around small tributaries of Mill Creek. Today, the majority of the storm sewers in Bellville drain into those tributaries.

4.1.2 Land Use

The land use in the Mill Creek watershed is comprised mainly of rice fields, farmlands, and ranches, though urban land use can be found within the city of Bellville (Table 4-1). Cattle and horse-rearing activities are located in several locations within the watershed. Areas with agricultural uses are noted on the watershed reconnaissance map located in Appendix A. Cemeteries are also included on the reconnaissance maps. Fifty-four cemeteries are spread throughout the watershed and are mapped as potential pollutant point sources due to the possibility for embalming fluids to leach into the soil and/or groundwater.

In the Mill Creek watershed (LUL)	, ,
Land Use Land Cover Categories	Acres
High Intensity Developed	94
Medium Intensity Developed	452
Low Intensity Developed	1,355
Open Spaces Developed	1,270
Cultivated Land	4,098
Pasture/Hay	140,354
Grassland	14,086
Deciduous Forest	35,005
Evergreen Forest	11,007
Mixed Forest	4,584
Scrub/Shrub	23,519
Palustrine Forest Wetland	17,322
Palustrine Scrub/Shrub Wetland	64
Palustrine Emergent Wetland	650
Unconsolidated Shore	194
Bare Land	278
Water	1,138

Table 4-1 Acreages of Land Use Land Cover (LULC) in the Mill Creek Watershed (LULC data, 2005)

4.1.3 Illegal Dumping

No illegal dumping was found during the watershed reconnaissance survey.

4.1.4 Habitat Types

Mill creek follows a meandering path through interspersed pasture land, blackland prairie, coastal prairie, and hardwood forest floodplain (LULC data, 2005) and provides habitat for a diverse fish community, including spotted gars, minnows, common carp, river carpsuckers, channel catfish, and several sunfish species (Moring, et al, 1998). The surrounding area is known as the Katy Prairie and is one of the country's premier wintering waterfowl regions despite virtually all of the grassland having been converted to rice fields. The rice fields act as artificial wetlands that attract migrant shorebirds, such as the American golden-plover, Hudsonian godwit, pectoral sandpiper, and the buff-breasted sandpiper. The bottomland forest that surrounds much of the creek provides habitat for numerous woodland birds, such as wrens, sparrows, vireos, warblers, and eastern bluebirds. The most ecologically significant segment of Mill Creek is from the confluence with the Brazos River upstream to the point of convergence of the West and East Forks of Mill Creek (TPWD, 1999).

4.1.5 Signs of Human Use (Pre-History and Today)

4.1.5.1 Pre-History

Archeological evidence available suggests that human habitation in the area began as early as 7400 B.C. during the Paleo-Indian Period. The county lies in what appears to have been during late pre-history a zone of cultural transition between inland and coastal aboriginal peoples. During the early historic era, the principal inhabitants were the Tonkawas, a nomadic, flint-working, hunting and gathering people, living in widely-scattered bands, who traveled hundreds of miles in pursuit of buffalo and practiced little if any agriculture (University of Texas, 2007). Today Mill Creek is known for its unique artifacts left by pre-historic inhabitants. Amateur archeologists in Texas are known to search the Mill Creek streambed for arrowheads, stone tools, and pottery.

4.1.5.2 Human Use Today

There are numerous road crossings in the Mill Creek watershed that allow for easy accessibility by the public. Most road crossings with the creek in the upper reaches of the watershed are bordered by private property and contain barbed-wire fencing across the downstream side of the creek from the bridge. Barbed-wire fencing was also encountered along and across reaches at sampling sites. There are also large sand bars located on private property in the lower portions of the watershed that allow for easy access to the creek for some property owners. All access points to the creek are noted on the watershed reconnaissance map in Appendix A.

4.1.6 Nearby Developed Areas

The city of Bellville, with a population of 3,794 people (U.S. Census Bureau, 2000) is located at the intersection of SH 36 and SH 159 and is 3.6 miles north of site UAA2. Other notable communities within



the surrounding area of Mill Creek are the cities of Industry and Bleiblerville. Industry, with a population of 304 people (U.S. Census Bureau, 2000) is located at the intersection of SH 159 and FM 109. Industry is 2.7 miles southwest of site UAA1. Bleiblerville, a community of approximately 100 people (University of Texas, 2007) is located at the intersection of SH 159 and FM 2502, 9 miles west of the city of Bellville. Bleiblerville is located 3.6 miles south of UAA4 and 4.7 miles east of UAA1. All major towns in the watershed are labeled on the watershed reconnaissance map in Appendix A.

4.2 HABITAT ASSESSMENT

The HQI (Part III of the SWQM Procedures) values are based upon the values obtained in Part II of the SWQM Procedures and upon field notes. The results of each parameter measured are summarized in Table 4-2. The criteria used in ranking each of the HQI parameters are outlined in the following section.

As defined in the project QAPP, the HQI provides a quantitative measure of a water body's physical conditions suitability for aquatic life—the higher the score, the better the fishing. This parameter is therefore an appropriate metric for determining if a particular water body is suitable or attractive for recreational fishing. It is not, however, suitable for evaluating boating uses or swimming uses. PBS&J altered the building blocks and scoring methods used to determine the HQI in an effort to derive a new metric we called the SSI. Since the SSI was not in use prior to this study, we were restricted to using HQI input measurements.

The SSI scores are based on all but two parameters from the HQI. The two parameters that do not apply to swimming are Channel Sinuosity and Riparian Buffer Vegetation (width). The SSI ranking for the two parameters, Available Instream Cover and Number of Riffles, is inverse to that used to develop the HQI scores. The remaining parameters (i.e., Bottom Substrate Stability, Dimensions of Largest Pool, Channel Flow Status, and Aesthetics of Reach) are equivalent to the HQI scoring methods. The SSI calculation also includes velocity, depth, and turbidity, which are important factors in evaluating swimming suitability. Detailed explanation of the criteria used in ranking each of the SSI parameters is included in the following section. The SSI scores are summarized in Table 4-3. Site maps showing the locations of each transect are located in Appendix D and representative photos taken at each transect are located in Appendix F.

4.2.1.1 Riparian Zone

<u>HQI</u>

Riparian buffer vegetation is important in maintaining stream health through shading, dispersing runoff, and preventing erosion. The amount of riparian buffer vegetation was ranked as extensive (3), wide (2), moderate (1), or narrow (0), based upon the width of the natural buffer.

Aesthetics were ranked as wilderness (3), natural area (2), common setting (1), or offensive (0), based upon the natural beauty, the amount of trees and vegetation, and the amount of development (including water clarity and aesthetic effects resulting from development).

<u>SSI</u>

Riparian buffer vegetation width was not used in ranking the riparian zone for swimming, as it does not affect swimmers. However, the number of large trees or the number of large overhanging limbs may be a parameter to consider in future studies since trees may provide shade for swimmers and/or overhanging limbs for recreational use such as rope swinging.

Aesthetics were ranked in the same manner for the swimming HQI as for the SWQM Procedures HQI, since aesthetics contribute to the recreational user's experience.

4.2.2 Stream Physical Characteristics

<u>HQI</u>

Available in-stream cover is important for fish and benthic organisms. This parameter was ranked as abundant (4), common (3), rare (2), or absent (1), based on the percentage of substrate that provides stable habitat.

In determining habitat type, only those riffles that extended to greater than 50 percent of the channel width and were at least as long as the channel width were counted. However, the total number of riffles within each reach was tallied regardless of size. Ranking consisted of abundant (\geq 5 riffles), common (2-4 riffles), rare (1 riffle), or absent (no riffles).

<u>SSI</u>

Riffles, which are typically shallow, are important in considering streams for recreational use, such as canoe or kayak activities. In-stream cover in the form of downed trees, woody debris, or thick vegetation can be a hindrance to swimming activities. Therefore, scoring was inverse to that of the aquatic organism HQI with parameter rankings as follows: (4) absent, (3) rare, (2) common, or (1) abundant.

Riffles can also be a hindrance to swimming when caused by submerged debris and thus were scored inversely to that of the aquatic organism HQI rankings. However, riffles have also been considered desirable under certain conditions and can enhance swimming activities when those conditions prevail.



4.2.2.1 Stream Morphology

<u>HQI</u>

In-stream flow affects the amount of potential habitat available to aquatic organisms such as fish; the greater the channel flow, the higher the available habitat, increasing chance of successful fishing. Channel flow was ranked as high (3), moderate (2), low (1), or no flow (0) based on percentage of the channel and/or channel substrate covered by water.

A high degree of sinuosity provides more diverse habitat, protects streams from excessive erosion and flooding, and provides shelter for aquatic organisms. Channel sinuosity was ranked as high (3), moderate (2), low (1), or none (0) based upon the number and type of bends.

<u>SSI</u>

In-stream flow affects the area available for swimming. If flows are too low, then a stream may not be suitable for swimming; if flows are too high the same might be true. Moderate flows are most desirable for swimming. Channel sinuosity, however, does not affect swimmers. This particular watershed is small and had low to moderate flows even during rainy conditions. Only an extreme flooding event would negatively impact swimming; therefore, the numbers assigned to each rank for the swimming HQI are the same as those in the SWQM Procedures, but are based on channel flow only.

4.2.2.2 Substrate

<u>HQI</u>

A somewhat firm foundation is important for swimming activities. Also, substrates containing gravel may provide additional cover for aquatic organisms. Bottom substrate stability was ranked as stable (4), moderately stable (3), moderately unstable (2), or unstable (1) based on percent gravel or larger substrate and dominant substrate type.

<u>SSI</u>

Since stability is important for safe swimming, the same ranking system was used as for the above HQI.

4.2.2.3 Aquatic Vegetation

Aquatic vegetation can provide cover for aquatic organisms. Aquatic vegetation can also hinder swimming activities. The presence or absence of aquatic vegetation was noted during the assessment. No aquatic vegetation was present in any of the reaches assessed.

4.2.2.4 Stream Depth

<u>HQI</u>

Pools provide potential cover for fish. Pool dimensions were ranked as large (4), moderate (3), small (2), or absent (1) based upon percentage of the channel width covered and upon maximum depth.

<u>SSI</u>

Pools also may provide space for swimming, which may result in full head immersion. Therefore, the same ranking system as that above was used for stream depth.

4.2.2.5 Stream Width

Stream width can affect stream shading, temperature, and flow. The stream width at the access point for each reach was 3.9, 5.2, and 28.4 meters the east, west, and main stem sites, respectively. Stream width was not used in formulating the HQI or the SSI.

4.2.2.6 Bank Slope

<u>HQI</u>

Bank stability affects stream use by wildlife and shelter for aquatic organisms. Stability is based upon erosion potential, which is dependent upon soil type, bank slope, and flow rates. Bank stability was ranked as stable (4), moderately stable (3), moderately unstable (2), or unstable (0) based on percentage evidence of erosion and upon average bank angles.

<u>SSI</u>

Bank stability is an important safety concern for stream users and is also important in estimating future impacts to the stream from recreational use. The same ranking system as above was used for this parameter.

4.2.3 Summary of Habitat Assessment

4.2.3.1 West Fork (UAA1)

The West Fork of Mill Creek (UAA1) yielded an HQI of 20 (high) and an SSI of 16 (high). Although the HQI is high, this tributary of Mill Creek may be suitable for recreation only during periods without drought. The reach was assessed during a year of exceptional rainfall and probably contained more water (an average of 0.35 meter [1.14 feet] with individual transect depths ranging from 0.15 to 0.76 meter [0.5 to 2.5 feet]) than during normal rainfall years. Currently, the creek may be suitable for catching minnows, which were seen in the portion near the bridge only; for wading; or for wildlife viewing

(several species of birds were noted during the assessment). No signs of recreational use were noted during the assessment. The reach contained only one pool (1.1 meters [3.6 feet] deep and 1.9 meters [6.2 feet] wide), near the bridge, so presumably only a small section of the reach would support fishing or swimming activities. However, wading and wildlife observation would be possible.

4.2.3.2 East Fork (UAA4)

The East Fork of Mill Creek (UAA4) yielded an HQI of 21 (high) and an SSI of 14 (high) (Tables 4-2 and 4-3). This tributary of Mill Creek was considerably colder than the West Fork and the main channel, indicating it is spring-fed and may remain at a relatively stable level year-round. Average depth of this reach was 0.37 meter (1.21 feet) and it contained a few shallow pools, most of which were less than 1 meter deep and covered less than 50 percent of the average stream width (5.8 meters, or 19.0 feet). The largest pool was at the first bend, just west of the bridge; it was 1.1 meters (3.6 feet) deep and 2.0 meters (6.6 feet) wide.

Due to the spring-fed nature of this reach, the presence of a trot line near the largest pool, and the discovery of two turtles during the assessment, it was determined that this reach probably contains fish of suitable size for fishing. Shallowness precludes swimming, but wading and wildlife observation would be possible.

4.2.3.3 Main Stem (UAA2)

Mill Creek (UAA2) yielded an HQI of 12 (limited) and an SSI of 18 (Tables 4-2 and 4-3). According to landowners along the creek, this portion of Mill Creek has been dredged and possibly channelized. All parameters of the HQI were scored at 2 or lower, while the SSI parameter scores were variable. Although the sludgy layer topping the sand substrate and the presence of fishing devices/debris (e.g., trot lines, fishing line) near the bridge may make this reach unsafe for swimming activities, the depth and moderate flows at this site provide good conditions for swimming. Although this reach contains an average of 0 percent cover for aquatic organisms, some under-cut banks do exist that could serve as cover for fish and thus be good for fishing. This reach is also suitable for swimming, tubing, canoeing, and kayaking due to previous channel dredging (average depth over the reach is 1.1 meters [3.6 feet]). Although the average vegetative buffer is less than 5.0 meters (16.5 feet), the bank height of approximately 6.1 meters (20.0 feet) (which was not officially measured for this assessment) prevents viewing of the surrounding pastureland, giving in-stream users a view of only the native vegetation buffer along the banks and therefore the impression of a natural setting.

4.2.3.4 Watershed

Mill Creek provides sufficient habitat for recreation from a watershed perspective. In spite of steep banks, some tributaries to the creek are probably suitable for fishing, wading, and/or wildlife viewing.



The main channel of Mill Creek is sufficiently deep and open for swimming, canoeing and kayaking, and possibly fishing, assuming there is enough cover for fish.



Table 4-2
Habitat Quality Index Scoring Components,
Mill Creek Habitat Assessment, Austin County, Texas

		UAA4	UAA2			
Habitat Parameter	Scoring Category	Score	Scoring Category	Score	Scoring Category	Score
Available In-stream Cover (1=absent, 2=rare, 3=common, 4=abundant)	Common	3	Common	3	Absent	1
Bottom Substrate Stability (1=unstable, 2=moderately unstable, 3=moderately stable, 4=stable)	Moderately unstable	2	Moderately unstable	2	Unstable	1
Number of Riffles (1=absent, 2=rare, 3=common, 4=abundant	Common	3	Abundant	4	Absent	1
Dimensions of Largest Pool (1=absent, 2=small, 3=moderate, 4=large)	Large	4	Moderate	3	Small	2
Channel Flow Status (0=no flow, 1=low, 2=moderate, 3=high)	Moderate	2	Moderate	2	Moderate	2
Bank Stability (0=unstable, 1=moderately unstable, 2=moderately stable, 3=stable)	Moderately unstable	1	Moderately unstable	1	Moderately stable	2
Channel Sinuosity (0=none, 1=low, 2=moderate, 3=high)	Moderate	2	High	3	None	0
Riparian Buffer Vegetation (0=narrow, 1=moderate, 2=wide, 3=extensive)	Moderate	1	Moderate	1	Moderate	1
Aesthetics of Reach (0=offensive, 1=common, 2=natural, 3=wilderness)	Natural area	2	Natural area	2	Natural area	2
Habitat Quality Index/Total Score ¹	High	20	High	21	Limited	12
1 Habitat Quality Index is as follows:						

Habitat Quality Index is as follows: 26-31 = Exceptional 20-25 = High 14-19 = Intermediate ≤13 = Limited



Table 4-3 Swimming Suitability Index, Mill Creek Habitat Assessment, Austin County, Texas

UAA1		UAA4		UAA2	
Scoring Category	Score	Scoring Category	Score	Scoring Category	Score
Common	2	Common	2	Absent	4
Moderately unstable	2	Moderately unstable	2	Unstable	1
Common	2	Abundant	1	Absent	4
Large ⁴	4	Moderate	3	Small	2
Moderate	2	Moderate	2	Moderate	2
Moderately unstable	1	Moderately unstable	1	Moderately stable	2
N/A	-	N/A	-	N/A	-
N/A	-	N/A	-	N/A	-
Natural area	3	Natural area	3	Natural area	3
High	16	High	14	High	18
	Scoring Category Common Moderately unstable Common Large ⁴ Moderate Moderately unstable N/A N/A N/A	Scoring CategoryScoreCommon2Moderately unstable2Common2Large44Moderate2Moderately unstable1N/A-N/A-Natural area3	Scoring CategoryScoreScoring CategoryCommon2CommonModerately unstable2Moderately unstableCommon2AbundantLarge44ModerateModeratel2ModerateModeratel1Moderately unstableN/A-N/AN/A3Natural area	Scoring CategoryScoreScoring CategoryScoreCommon2Common2Moderately unstable2Moderately unstable2Common2Abundant1Large44Moderatel3Moderately unstable2Moderatel1Large44Moderatel3Moderately unstable1Moderatel1N/A-N/A-N/A-N/A-Natural area3Natural area3	Scoring CategoryScoreScoring CategoryScoreScoring CategoryCommon2Common2AbsentModerately unstable2Moderately unstable2UnstableCommon2Abundant1AbsentLarge44Moderatel3SmallModeratel2Moderatel2ModerateModerate2Moderatel3SmallModeratel1Moderatel1ModerateModerately unstable1Moderately unstable1Moderately Moderately unstable1N/A-N/A-N/AN/A-N/A-N/AN/A3Natural area3Natural area

Swim Habitat Quality Index is as follows:

20-25 = Exceptional

. 14-19 = High

8-13 = Intermediate

≤7 = Limited

2 Channel sinuosity has no bearing on stream use for swimming.

3 Width of the riparian buffer vegetation has little effect on swimmers. However, the number of large trees or the number of large overhanging limbs may be a parameter to consider in future studies since trees may provide shade for swimmers and/or overhanging limbs for recreational use such as rope swinging.

This pool was within 30 feet of the bridge; pools were not typical over the remainder of the reach.



4.3 DRY AND WET WEATHER SAMPLING

4.3.1 Sample Dates

A total of six sample events were conducted in 2007 for the pilot study. Event 1 was conducted on June 13 and 14. The West Fork and East Fork sites were revisited on June 14 in order to collect flow readings that could not be taken on June 13. Event 2 was conducted on June 22. Sample Event 3 occurred on June 28 and 29. Sample Event 4 occurred on July 11 and Events 5 and 6 took place on July 24 and July 30, 2007, respectively. Mrs. Jean Wright of the H-GAC accompanied PBS&J staff on June 28 and again on July 24 for Events 3 and 5 in order to conduct field audits.

4.3.2 Field Conditions

Weather conditions during the study period were wetter than normal. Rainfall ranged from 0.35 to 1.93 inches. No sample event occurred during rain events, but all sampling events are considered post-rainfall sampling. Flow conditions at all sample sites were above normal for the entire study period and base flow conditions were not observed. The single highest rainfall event (1.93 inches) occurred two days before Event 2. For the month of June, a total of 8.14 inches of rainfall occurred. Rainfall occurring before Events 1, 3, and 4 was 0.87, 0.35, and 0.54 inch, respectively. These events occurred on June 3 and 26, and July 5.

4.3.3 Physical, Chemical, Hydrological, and Microbial Characteristics

4.3.3.1 Water Quality, Physical, and Hydrological Results

Data were collected at each of the three sample locations for physical, chemical, hydrological, and microbial characterization (Appendix H). Parameters were averaged for all the six sample events. The results of this characterization are summarized in Table 4-4.

Stream Characteristics								
Mean* Water Quality Values for Mill Creek UAA Sites 1, 2, and 4								
Sample Site	Flow (cfs)	Drainage Area (acres)	Temp (℃)	DO (mg/L)	Sp. Cond. (mS/cm)	рН	Secchi Depth (meters)	Stream Depth ^a (meters)
West	15.93	53, 058	27.17	6.16	0.43	7.75	0.36	0.2-0.76
Main	95.48	76,150	27.41	6.19	0.46	7.82	0.41	0.4–0.95
East	36.11	169,926	27.22	5.55	0.46	7.72	0.38	0.48–2

4-12

Table 4-4						
Stream Characteristics						

* N = 6 for all parameters except specific conductivity and DO where N=5. a = Range

Except for stream depth and flow, all other properties collected show little spatial and temporal variability. Sampling at each site occurred within a two-hour window of time across all sample events; therefore, variations resulting from time of collection should be negligible.

The average water temperature ranged from 27.17 to 27.22°C, which is normal for local streams for this time of year. Dissolved oxygen ranged from 5.55 to 6.19 milligrams/liter ("mg/L"), which is well within the standards to support quality wildlife. The mean specific conductivity ranged from 0.43 to 0.46 milliSiemens per centimeter ("mS/cm"), which is somewhat indicative of a freshwater stream for this area. It is possible that mixing of waters supplied from the many springs within the drainage basin and recent rainfall has diluted the stream water and lowered the conductivity levels. Specific conductivity ranged from 0.43 to 0.46 mS/cm, having a CV of 0.46, 0.44, and 0.48 for sites West Fork, Main Stem, and East Fork, respectively. Mean pH values ranged from 7.72 to 7.82, which were slightly lower than expected from a creek in this region; however, considerable rainfall had occurred during the study period and may have resulted in reducing pH values from what normally would be 8.0 to 8.3. Overall, pH remained relatively stable both spatially and temporally with a CV <0.02 between sample events and sample sites. Secchi disk readings ranged from 0.36 to 0.41 meter (1.2 to 1.35 feet), indicating a slightly turbid system. This is most likely a result of sediment resuspension caused by recent rainfall events and the muddy and sandy nature of the sediment in this area. These rainfall events contributed to differences in stream morphology as well. Differences in the stream depth and in the rate of flow varied both temporally and spatially. Stream depth varied somewhat between sample events due to several factors, including changes in bottom substrate caused by high flows. During sampling, the field team noticed that rainfall events cause sandbars to change in location and size throughout the study period. The mean flow for each sample location was 15.93, 95.48, and 36.11 cfs with CV's of 1.2, 0.62, and 1.47, respectively, for the West Fork, Main Stem, and East Fork of Mill Creek. The reason for such high variation in flow between sample location and sample event was due to watershed drainage size and rainfall amounts.

At the West Fork of Mill Creek, pH was in a range from 7.58 to 7.89, which is slightly lower than would be expected for the hard-water streams that are found in this area. The slight dip in pH from Sample Event 1 to Sample Event 2 could be a result of recent rainfall in the amount of 1.93 inches that occurred just two days prior to Sample Event 2 (Figure 4-1). It is also likely that the increased rainfall experienced in the recent weeks leading up to the Mill Creek UAA study have diluted the stream, thus causing an overall reduction in pH from what would be expected during this time of year. A similar pattern can be seen with regard to DO, which ranged from 5.94 to 6.35 mg/L. The highest readings occurred during the first sample event and then dropped off with increasing temperature and rate of flow. The CV for DO is 0.41 for site UAA-1 (West Fork), indicating very little temporal variability between sample events. Specific conductivity ranged from 0.32 to 0.52 mS/cm during the study period. Again, these values may be depressed due to dilution effects. The increasing trend over time was expected with the increase in summer air temperatures and solar heating. The flow at the West Fork of Mill Creek varied from sample



event to sample event, having a CV of 1.2. This variation represents the greater than normal rainfall this summer. Stream flow ranged from 0.04 to 48.95 cfs with an average flow of 15.93 cfs.

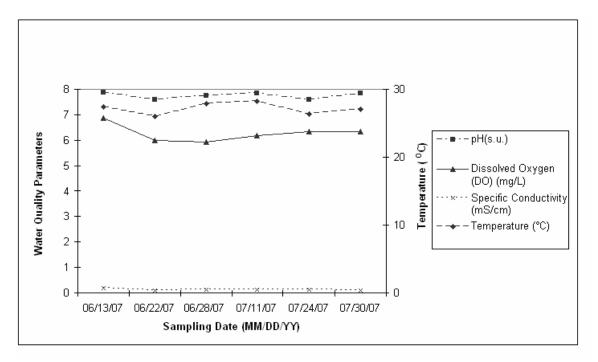


Figure 4-1 Water Quality Parameters Collected During Four Sample Events During June and July at Site UAA-1 (West Fork) on Mill Creek, Austin County

At the main fork of Mill Creek, pH was in a range from 7.74 to 7.88. Again, this is lower than would be expected for streams in this area. A similar pattern can be seen with regard to DO, which ranged from 5.55 to 6.19 mg/L. The highest readings occurred during the first sample event and then dropped off with increasing temperature and rate of flow. The CV for DO is 0.41, indicating moderate temporal variability between sample events. Specific conductivity ranged from 0.32 to 0.53 mS/cm during the study period. Again, these values may be depressed due to dilution effects. Water temperature ranged from 26.12 to 29.54°C during the study period. The increasing trend over time was expected with the increase in summer air temperatures and solar heating. The flow at the Main Stem of Mill Creek varied from sample event to sample event, having a CV of 0.62. This variation represents the greater than normal rainfall this summer. Stream flow ranged from 22.30 to 164.70 cfs, with an average flow of 95.48 cfs.



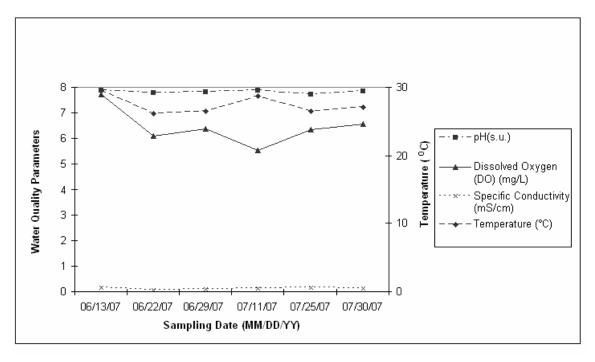


Figure 4-2 Water Quality Parameters Collected During Four Sample Events During June and July at Site UAA-2 (Main Stem) on Mill Creek, Austin County

At the East Fork of Mill Creek, pH was in a range from 7.61 to 7.84. This pattern follows that of the other sample sites and can be seen with regard to DO, which ranged from 5.29 to 5.87 mg/L. The CV for DO is 0.40, indicating moderate temporal variability between sample events. Specific conductivity ranged from 0.32 to 0.73 mS/cm during the study period. Again, these values may be depressed due to dilution effects. Water temperature ranged from 26.48 to 28.26°C during the study period. The increasing trend over time was expected with the increase in summer air temperatures and solar heating. The flow at the East Fork of Mill Creek also experienced temporal variation from sample event to sample event, having a CV of 1.47. This variation is again attributed to higher than normal rainfall this summer. Stream flow ranged from 2.12 to 143.19 cfs, with an average flow of 36.11 cfs.

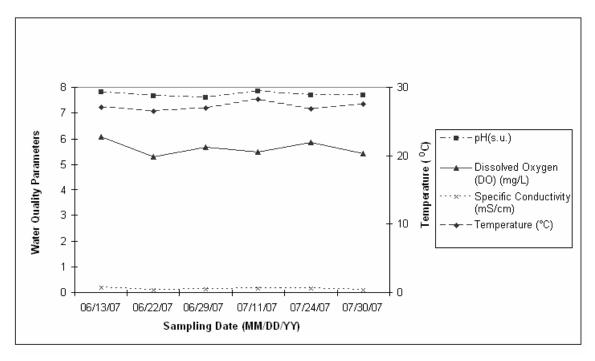


Figure 4-3 Water Quality Parameters Collected During Four Sample Events During June and July at Site UAA-4 (East Fork) on Mill Creek, Austin County

4.3.3.2 Nutrient and Solids Results

TP, TKN, Nitrate-Nitrite, and TN were collected for sample events 4, 5, and 6. Summary statistics for nutrients are located in Appendix I. Mean concentration of samples for TP and TKN collected from the West Fork site are 0.38 and 6 mg/L, respectively. NH_4 -N, low level, ranged from 0.02 to 0.14 mg/L. TSS and VSS ranged from 10.40 to 29.30 and 4.00 to 13.30 mg/L, respectively, for this sample location. Nitrate- Nitrite measured from the West Fork ranged from 0.18 to 0.21 mg/L. TKN and Nitrate- Nitrite used to calculate TN which ranged from 4.88 – 7.91 mg/L.

At the Main Stem of Mill Creek, TP and TKN are 0.4 and 6.83 mg/L, respectively. NH_4 -N was 0.02 to 0.08 mg/L. TSS and VSS ranged from 17.70 to 108.00 and 6.00 to 20.00, respectively. Nitrate-Nitrite measured from the Main Stem ranged from 0.15 to 0.20 mg/L. TKN and Nitrate-Nitrite used to calculate TN which ranged from 4.15 – 9.40 mg/L.

At the East Fork of Mill Creek, TP and TKN are 0.36 and 6.17 mg/L, respectively. NH_4 -N ranged from 0.02 to 0.07 mg/L. TSS and VSS ranged from 13.00 to 96.00 and 4.60 to 24.00, respectively. Nitrate-Nitrite measured from the East Fork ranged from 0.17 to 0.22 mg/L. TKN and Nitrate-Nitrite used to calculate TN which ranged from 5.39 to 8.29 mg/L.

4.3.3.3 Bacteria Results

The purpose of the results detailed below was to test different methods for collecting bacterial data and to determine if taking one grab sample is a sufficient sampling technique. The different types of sampling methodologies were evaluated in order to determine the most efficient way to maximize data collection. The following section details the results of comparing a single grab sample to subsequent samples collected during a single sampling event. Summary statistics for *E. coli* during each sampling event are also addressed (Appendix I). Additional analysis comparing *E. coli* and various stream characteristics is presented in Appendix J.

4.3.4 Evaluation of Bacterial Sampling Methods

Four methods of characterizing bacterial densities were evaluated during this project. Each method required multiple samples to be collected, handled, and analyzed. To evaluate the methods, PBS&J statistically compared the first grab sample obtained at each site using each method against the geometric mean of the remaining samples obtained for each method using a one-sample t-test. This was conducted to determine if the multiple sampling approaches produced statistically different results than the single grab sample. Below are three graphs (Figures 4-4 through 4-6) illustrating the first grab sample, and an adjacent boxplot representing the distribution of the remaining samples collected during the event excluding the grab sample. Based on the p-values from the t-tests, the data suggest that methods of sampling or sampling event do not result in statistically different data. The only statistical difference detected occurred at the East Fork during the time series sampling event.

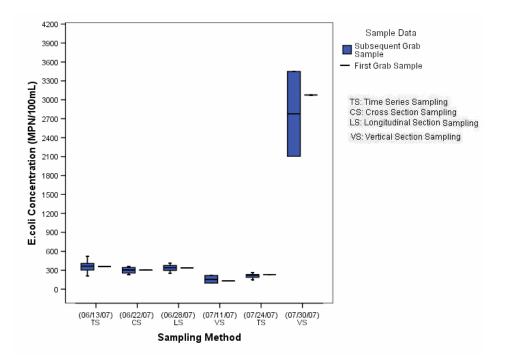
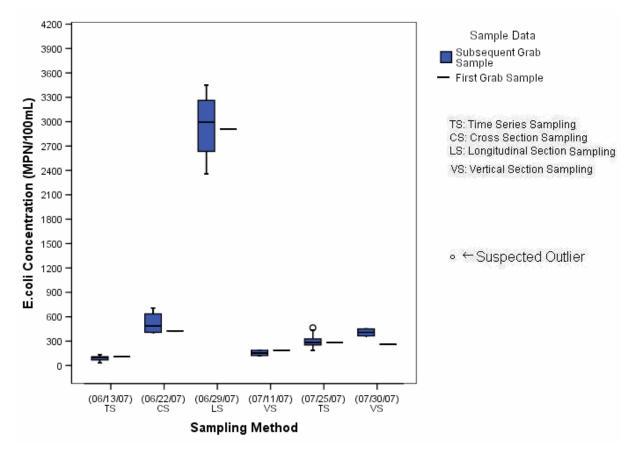
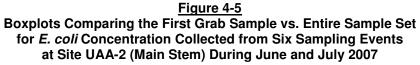
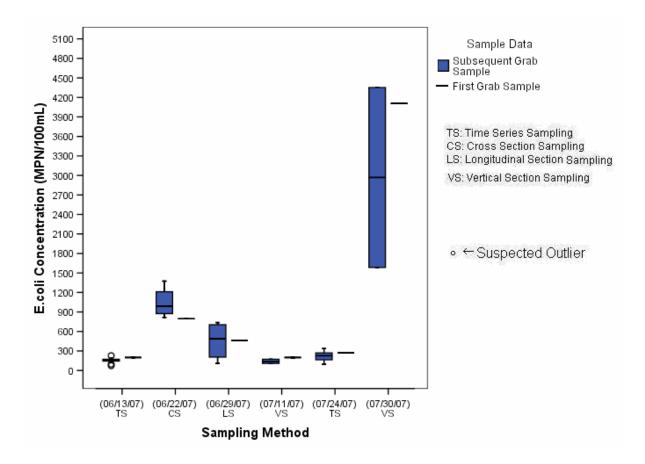
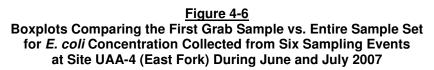


Figure 4-4 Boxplots Comparing the First Grab Sample vs. Entire Sample Set for *E. coli* Concentration Collected from Six Sampling Events at Site UAA-1 (West Fork) During June and July 2007









Time Series (Event 1)

Table 4-5 depicts the descriptive statistics for the times series sampling event conducted on June 13. *E. coli* concentrations for the three sample locations vary somewhat within one sampling event per site. The East Fork site had a CV of 0.73, suggesting there was a difference in *E. coli* concentrations over a one-hour period. The descriptive statistics from the West Fork and Main Stem sites differ from the East Fork site in that the CV's are very low, 0.23 and 0.34, respectively. *E. coli* concentrations did vary between sites, with the West Fork site showing the highest concentrations and the Main Stem showing the lowest. These trends do not remain consistent throughout every sampling event.



	Table 4-5		
Descriptive Statistics for the Tir		-	
Statistic	West Fork (UAA1)	East Fork (UAA4)	Main Stem (UAA2)
Number of Samples	12	12	12
Mean (MPN/100mL)	360	158	92
Minimum (MPN/100mL)	211	74	31
Maximum(MPN/100mL)	520	228	134
Standard Deviation (MPN/100mL)	83	42	32
Standard Error (MPN/100mL)	24	12	9
Coefficient of Variation	0.23	0.26	0.34
Geometric Mean (MPN/100mL)	350	152	86

Cross-Section (Event 2)

Table 4-6 depicts the descriptive statistics for the cross-section sampling event conducted on June 22. *E. coli* concentrations for the three sample locations vary little at each site during each sampling event. CV's ranged from 0.16 to 0.24, suggesting one grab sample may be sufficient for determining bacteria at a given location. *E. coli* did vary between sites, with the West Fork site showing the lowest concentrations and the Main Stem showing the highest. These trends do not remain consistent throughout every sampling event.

Descriptive Statistics for the Cross	Table 4-6 Section Sampling	g Method at Three S	ampling Locations
Statistic	West Fork (UAA1)	East Fork (UAA4)	Main Stem (UAA2)
Number of Samples	5	5	5
Mean (MPN/100mL)	299	993	747
Minimum (MPN/100mL)	231	794	408
Maximum(MPN/100mL)	359	1374	708
Standard Deviation (MPN/100mL)	49	236	132
Standard Error (MPN/100mL)	22	105	59
Coefficient of Variation	0.16	0.24	0.18
Geometric Mean (MPN/100mL)	296	972	490

Although descriptive statistics are computed for all sites, the conditions at the Main Stem site did not allow for depth and flow measurements to be collected across the entire stream. Descriptive statistics are presented in Appendix I. For this reason, the Main Stem site was not included in scatter plots for velocity or depth comparisons and no scatter plot for flow was created.

Longitudinal (Event 3)

Table 4-7 depicts the descriptive statistics for the longitudinal section sampling event conducted on June 28 and 29. *E. coli* concentrations for the three sample locations vary little within one sampling event per site. CV ranged from 0.13 to 0.56, suggesting one grab sample may be sufficient for determining



bacteria at a give location. *E. coli* did vary between sites, with the West Fork site showing the lowest concentrations and the Main Stem showing the highest. These trends do not remain consistent throughout every sampling event.

Descriptive Statistics f	<u>Table 4-7</u> or the Longitudina Three Sampling Lo		Method
Statistic	West Fork (UAA1)	East Fork (UAA4)	Main Stem (UAA2)
Number of Samples	4	5	5
Mean (MPN/100mL)	335	457	2940
Minimum (MPN/100mL)	253	109	2359
Maximum(MPN/100mL)	410	738	3448
Standard Deviation (MPN/100mL)	64.25	259	392
Standard Error (MPN/100mL)	32	116	176
Coefficient of Variation	0.19	0.57	0.13
Geometric Mean (MPN/100mL)	330	377	2918

Vertical (Event 4)

Table 4-8 depicts the descriptive statistics for the longitudinal section sampling event conducted on July 11. *E. coli* concentrations for the three sample locations vary little within one sampling event per site. CV ranged from 0.23 to 0.41, suggesting one grab sample may be sufficient for determining bacteria at a given location. *E. coli* did vary between sites, with the West Fork site showing the lowest concentrations and the Main Stem showing the highest. These trends do not remain consistent throughout every sampling event.

Descriptive Statistics for the Ve	Table 4-8 rtical Sampling Me	ethod at Three Sam	pling Locations
Statistic	West Fork (UAA1)	East Fork (UAA4)	Main Stem (UAA2)
Number of Samples	3	3	3
Mean (MPN/100mL)	148	160	165
Minimum (MPN/100mL)	97	109	122
Maximum(MPN/100mL)	216	199	187
Standard Deviation (MPN/100mL)	61	46	38
Standard Error (MPN/100mL)	35	27	22
Coefficient of Variation	0.41	0.29	0.23
Geometric Mean (MPN/100mL)	140	155	162

Time Series(Event 5)

Table 4-9 depicts the descriptive statistics for the times series sampling event conducted on June 13. *E. coli* concentrations for the three sample locations vary somewhat within one sampling event per site.

The East Fork site had a CV of 0.73, suggesting there was a difference in *E. coli* concentrations over a one-hour period. The descriptive statistics from the West Fork and Main Stem sites differ from the East Fork site in that the CV's are very low, 0.23 and 0.34, respectively. *E. coli* concentrations did vary between sites, with the West Fork site showing the highest concentrations and the Main Stem showing the lowest. These trends do not remain consistent throughout every sampling event.

Descriptive Statistics for the Tir	<u>Table 4-9</u> ne Series Sampling	Method at Three Sa	mpling Locations
Statistic	West Fork (UAA1)	East Fork (UAA4)	Main Stem (UAA2)
Number of Samples	12	12	12
Mean (MPN/100mL)	213	221	299
Minimum (MPN/100mL)	148	95	185
Maximum(MPN/100mL)	259	336	464
Standard Deviation (MPN/100mL)	34	75	81
Standard Error (MPN/100mL)	10	22	23
Coefficient of Variation	0.16	0.34	0.27
Geometric Mean (MPN/100mL)	210	207	290

Vertical (Event 6)

Table 4-10 depicts the descriptive statistics for the longitudinal section sampling event conducted on July 11. *E. coli* concentrations for the three sample locations vary little within one sampling event per site. CV ranged from 0.23 to 0.41, suggesting one grab sample may be sufficient for determining bacteria at a given location. *E. coli* did vary between sites, with the West Fork site showing the lowest concentrations and the Main Stem showing the highest. These trends do not remain consistent throughout every sampling event.

Descriptive Statistics for the	<u>Table 4-10</u> Vertical Sampling M	lethod at Three Samp	ling Locations
Statistic	West Fork (UAA1)	East Fork (UAA4)	Main Stem (UAA2)
Number of Samples	3	3	3
Mean (MPN/100mL)	2876	3348	358
Minimum (MPN/100mL)	2105	1585	259
Maximum(MPN/100mL)	3448	4352	450
Standard Deviation (MPN/100mL)	693	1531	96
Standard Error (MPN/100mL)	400	884	55
Coefficient of Variation	0.24	0.46	0.27
Geometric Mean (MPN/100mL)	2816	3048	349

4.4 RECREATIONAL SUITABILITY

4.4.1 Summary of Interviews of Stream Users

During the field reconnaissance survey, field team members interviewed the WWTP operator at the City of Bellville and City of Industry WWTP. In addition to this, they also interviewed a sheriff in Bellville and property owner next to the Mill Creek. Two additional interviews were conducted during the wet and dry weather monitoring and habitat assessment when field team members spoke to two sets of people that arrived at the Main Stem site (UAA2) during sampling. Complete interview forms were not filled out as these observers were eager to move on to business elsewhere; however, team members were able to get some information from users about their contact recreation activities on Mill Creek. One set of users arrived at the stream to determine if "fish were running" and were interested in placing trot lines in the creek. The other person was interested in the field activities occurring. Contact information for these individuals was not obtained but the team members received other data regarding uses. This data were entered on an interview form (Appendix K).

Additionally, scheduled interviews and opportunistic interviews were held with local officials, business owners, and owners of land fronting Mill Creek in all major towns within the watershed. These interviews are summarized below.

4.4.2 Bellville, Texas

On July 16, PBS&J staff attended a meeting with Judge Carolyn Bilski. The judge invited realtor Frank Monk and land owner Gordon Goebel to discuss their knowledge of Mill Creek. Mr. Monk owns the property upstream of the Main Stem site, and Mr. Goebel owns the property downstream of site UAA2. The judge informed us of the proactive manner in which the city has kept the creeks and steams clean by hiring an environmental officer to prevent illegal dumping. Mr. Goebel and Mr. Monk informed us that many people other than land owners enter the creek at the Main Stem site. Mr. Monk says the creek attracts people from all around because it is well-known for containing arrowheads. The creek is used for the most part by land owners and their friends for kayaking and fishing.

A meeting was also held with Mr. Arlie Kendrick, Belleville's wastewater superintendent, on July 16, 2007. He stated that the treated wastewater from the plant feeds into Boggy Creek, which enters Mill Creek downstream of SH 36. The plant services 4,000+ people with TCEQ Permit No. 10385-002.

During a conversation with the proprietor of a barbecue restaurant north of the Main Stem site, he suggested to PBS&J staff that the creek area on Mr. Monk's property "looks really good for a little park area."

4.4.3 Bleiblerville, Texas

PBS&J employees interviewed Matt Macat and a friend in a local store on FM 2502 in Bleiblerville. Mr. Macat, who lives in Bellville, told them that prior to the last two or three years, he and a friend, Mr. Charles Peschel, used to go fishing two to three times a year at a place on Mill Creek called Blue Hole. They used a jonboat to enter the creek and used hook-and-line or trot lines to catch fish. His friend stated that over 50 years ago the creek was the place to go for swimming, fishing, and other recreational activities. Mr. Macat said that his friend Mr. Peschel owns the land next to the Blue Hole. Mr. Macat also stated that Mr. David Jackson, Mr. Byran Balkey, Mr. Mike Aldridge, and Mr. Balchek own creek-front property in the area.

4.4.4 Industry, Texas

In the town of Industry, PBS&J employees were directed to speak with a local lumber yard/hardware store owner, Mr. Everett F. Schmidt. Mr. Schmidt owns property fronting the west fork of Mill Creek. On July 16, 2007, Mr. Schmidt stated that over the past two to three years the creek has dried up, so he stopped using it. The 10 to 15 years prior to that, he would fish a couple of times a year, particularly on Good Friday. He has also observed other people using the creek for fishing and picnicking.

4.4.5 Summary of Contact Recreation Uses

A total of 14 individuals were interviewed during the study period. The primary locations for contact recreation to occur on Mill Creek appear to be downstream of the West Fork site and the stream reach between Mill Creek Road and FM 2429, just upstream of the Main Stem site. The current primary contact recreation uses include fishing, swimming, tubing, and arrowhead hunting. In the past, swimming and fishing occurred at a higher frequency and was more widespread throughout the watershed, but increased sediment loads have contributed to creating a shallower creek so that contact recreation activities only occur in the isolated areas stated above.

5.1 SUMMARY OF FIELD ACTIVITIES

During this pilot study, PBS&J was tasked by H-GAC to conduct a watershed reconnaissance to help identify pollution sources and recreational activities in the watershed, to characterize bacteria concentrations using four different sampling methods, to assess the habitat of the study reaches to help assess each reach's suitability for contact recreation, and to document existing uses via interviews. The intent of the data collection effort was to assess whether these methods were appropriate for regional or state-wide use to conduct recreational UAA's in the future. The following discussion provides an assessment of whether the approaches used in this pilot study are appropriate to implement going forward on a regional and state-wide basis.

5.2 WATERSHED RECONNAISSANCE METHODS

Watershed reconnaissance methods, both field visits and data recording methods, were appropriate and helpful in identifying both pollution sources and recreational activities in the watershed. For example, during reconnaissance work, field staff noted that most of the creek flowed through privately-owned land and that fencing followed property boundaries crossing the creek in multiple locations. This would, of course, limit boating opportunities. While paper datasheets are adequate for recording information, if UAA's are conducted on many water bodies throughout the state, data collection and management would be greatly facilitated if electronic field data collection tools could be employed. Tablet computer technology has advanced so that screen visibility is not a concern, even in direct sunlight. Field computers also are available that are more rugged and waterproof than ever before for field use.

5.3 BACTERIAL DENSITY AND WATER QUALITY MEASUREMENT METHODS

Four methods of characterizing bacterial densities were evaluated during this project. Each method required multiple samples to be collected, handled, and analyzed. To evaluate the methods, PBS&J statistically compared the first grab sample obtained at each site using each method against the geometric mean of the group of samples obtained using each method to determine if the multiple sample approach produced a statistically different result than the single grab sample. There was no statistical difference between the first grab sample and the subsequent samples pooled. Therefore, it appears that collecting a single grab sample is suitable to characterize the bacteria levels for the Mill Creek watershed. A single grab sample is also the most cost-effective approach to attain bacteria results since the other methods required three to five people per site and requires an extended time to collect bacteria samples. It should be noted that the low sample size and small number of sample sites may not allow these findings to be directly extrapolated to other, more complex, watersheds.



During the pilot study, detailed depth and velocity information (flow) was obtained to uncover any correlations among these variables and bacterial densities. Because no significant correlations were observed and because multiple velocity-depth measurements at the same site take a significant amount of additional time, it is recommended that only one set of velocity-depth measurements be required at each bacteria sampling site. The collection of general water quality measurements and, importantly, depth and velocity, should definitely be included in any future UAA protocols. Velocity and depth measurements directly relate to the suitability of recreational activities at the time of sampling. For example, high velocities or low depths might preclude a swimming recreation use.

5.4 HABITAT ASSESSMENT METHODS

Habitat assessment procedures were used during the pilot to help assess whether the water body in question was suitable for contact recreational uses. As defined in the project QAPP, the HQI provides a quantitative measure of a water body's physical condition suitability for aquatic life—the higher the score, the better the fishing. This parameter is therefore an appropriate metric for determining if a particular water body is suitable or attractive for recreational fishing. It is not, however, suitable for evaluating boating uses or swimming uses.

PBS&J altered the building blocks and scoring methods used to determine the HQI in an effort to derive a new metric we called the SSI. This approach was explained in Sections 3.2 and 4.2. Since the SSI was not in use prior to this study, we were restricted to using HQI input measurements. In the future, a more refined SSI could be developed that would consider all factors and field observations needed to evaluate swimming suitability. These factors could include: depth, velocity, temperature, access, vegetation conditions, odor, aesthetics, turbidity, bank and bed conditions, physical hazards, and other factors. A new SSI form could be developed (hard copy or electronic) to help guide the collection and management of the field data necessary to calculate the SSI.

5.5 METHODS TO DOCUMENT RECREATIONAL USES

During the pilot study, questionnaires were used to guide and document face-to-face interviews with recreational users or were provided to subjects to fill out by themselves. Subjects were found when they approached field staff or by scheduling interviews with known land owners. Face-to-face interviews were generally successful; however, a low response rate was seen among subjects receiving the questionnaires for self-completion.

A more robust method of documenting recreational uses has been employed in the Santa Ana River Watershed in San Bernardino, Riverside, and Orange Counties in California (Moore, 2007). In this watershed, stakeholders deployed Internet-enabled video surveillance cameras that took a still photograph every 15 minutes during daylight hours for one year. This generated 63,332 pictures of one water body during a year long study. The frequency allowed stakeholders to assess not only the type of recreational



use, but the duration and frequency of the uses. This method of use documentation should be strongly considered for certain Texas water bodies, if stakeholder interest is high and adequate funding is available.

There appear to be two goals for documenting recreational uses in the context of a UAA or a surface water quality criteria adjustment study. First, water quality managers may wish to enroll as many recreational users as possible for epidemiological or risk assessment work. Alternatively, managers may wish to rigorously characterize the existing use of a water body under study. While the data collection for each method may be the same, the site selection methods may differ significantly.

In the first case, when researchers are trying to maximize observations, a biased sampling approach is appropriate. This would mean that subjects should be recruited and interviewed or monitored at sites most suitable for recreational uses. In the second case, when researchers are trying to objectively determine what existing uses are present, a randomized site selection process should be employed. This will allow for any variation in the water body to be addressed in the study design. For example, if an urban stream had concrete bed and banks for 90 percent of its length, and natural conditions with a park for 10 percent of its length, it might be inappropriate to extrapolate conditions and uses occurring at the park for the entire length.

5.6 AMENDMENTS TO DRAFT DATA COLLECTION PROTOCOL

The Contact Recreation UAA Protocol, when finalized, will provide guidance to interested investigators during the performance of UAA studies for waters of the state. The Draft Protocol served as the guidance document for PBS&J during the performance of all project-related activities. Methods, procedures, and datasheets provided in the Draft Protocol were utilized during various stages of the pilot study. The four field data sheets provided as part of the Draft Protocol included:

Data Sheet A – Water Body Information Data Sheet B – Site Characterization Datasheet C – Water Quality Data and Depth Measurements Data Sheet D – Recreational Use Interview

Overall, the draft protocol was generally found to be exhaustive regarding the guidance it provided for activities performed during the pilot study. References made to the TCEQ SWQM were found to be accurate and to the point. Presented below are recommended changes and adjustments to various components of the draft protocol.

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Data Sheet A allows the project team to provide stream segment information, define the reach or subsegment to be studied, and record WWTP information. PBS&J recommends that the SLOC's be used instead of this data sheet since the two documents duplicate each other in terms of the data collected. However, if this data sheet is maintained, a footnote or similar statement should be provided indicating that the data sheet should be utilized only at the beginning of field data collection activities for all stream segments or sites until such time as changes to segments or sites are made.

Data Sheet B is used to record site location data, including WWTP information, field team members, and weather conditions. Additional information provided on this data sheet include GPS location data, Users Observed, Surrounding Conditions, Indications of Human Use, Photos, Stream Morphology, Aquatic Vegetation, and Water Characteristics. PBS&J recommends the following:

- Data Sheet Layout: The stream segment information, weather conditions, location description, and field personnel information should be rearranged in a user-friendly manner.
- Additional Data: Wind Intensity, Recent Significant Rainfall, and Quantity of Rainfall should be added under weather conditions. "None" should be added as a check-box option under Uses Observed and Indications of Human Use. The check-boxes for Surrounding Conditions should be redesigned to allow for the selection of "I" or "P" for each option. The preferred method for collecting substrate data should be provided on the data sheet. Finally, Water Clarity (in the absence of secci measurements) and Debris in Water should be provided as options under Water Characteristics.
- Site Location GPS Data: Non-GPS methods should be provided as options for recording site location data at the access points if GPS data for sub-segments are collected under Data Sheet A.

Data Sheet C facilitates the recording of stream width and length at the access point, field measured parameters, parameters collected for laboratory analysis, bacterial data collection method, and stream depth. PBS&J recommends the following:

- Stream Width, Length, and Depth: These parameters should be lumped together on the Data Sheet. The stream length assessed per field visit should be determined not only on whether the stream is wadeable or not, but also on the holding times for laboratory-collected samples. The stream depth tables should be modified to allow flow velocities to be recorded on the data sheet alongside depths.
- Field Parameters: The required units of measurement for all field-measured parameters should be provided on the data sheet. Data entry fields Sample Time, Sample Depth, and Data Logger should be added under field parameters.



- Parameters Collected for Lab Analysis: Additional data entry fields should be provided to record additional parameters not provided on the data sheet.
- Bacterial Data Collection: The collection method for bacteria should be standardized based on the recommendations from this report

The pilot study also examined the time constraints encountered during field activities. Based on the field activities performed during the study at individual sites, PBS&J determined that the amount of time spent at each site was dependent on the following:

- Number of field team members
- Field conditions (stream accessibility, flow severity, and stream depth)
- Data collection equipment and logistics
- Method of bacteria collection (several time dependent methods were employed)
- Number of stream depth measurement cross-sections and the length of stream assessed

The maximum and minimum number of hours spent at any one site was 2.5 and 1, respectively. It is worthy to note that time management played a key role during the performance of UAA activities on the multiple stream segments or sites.

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LULC data. 2005.

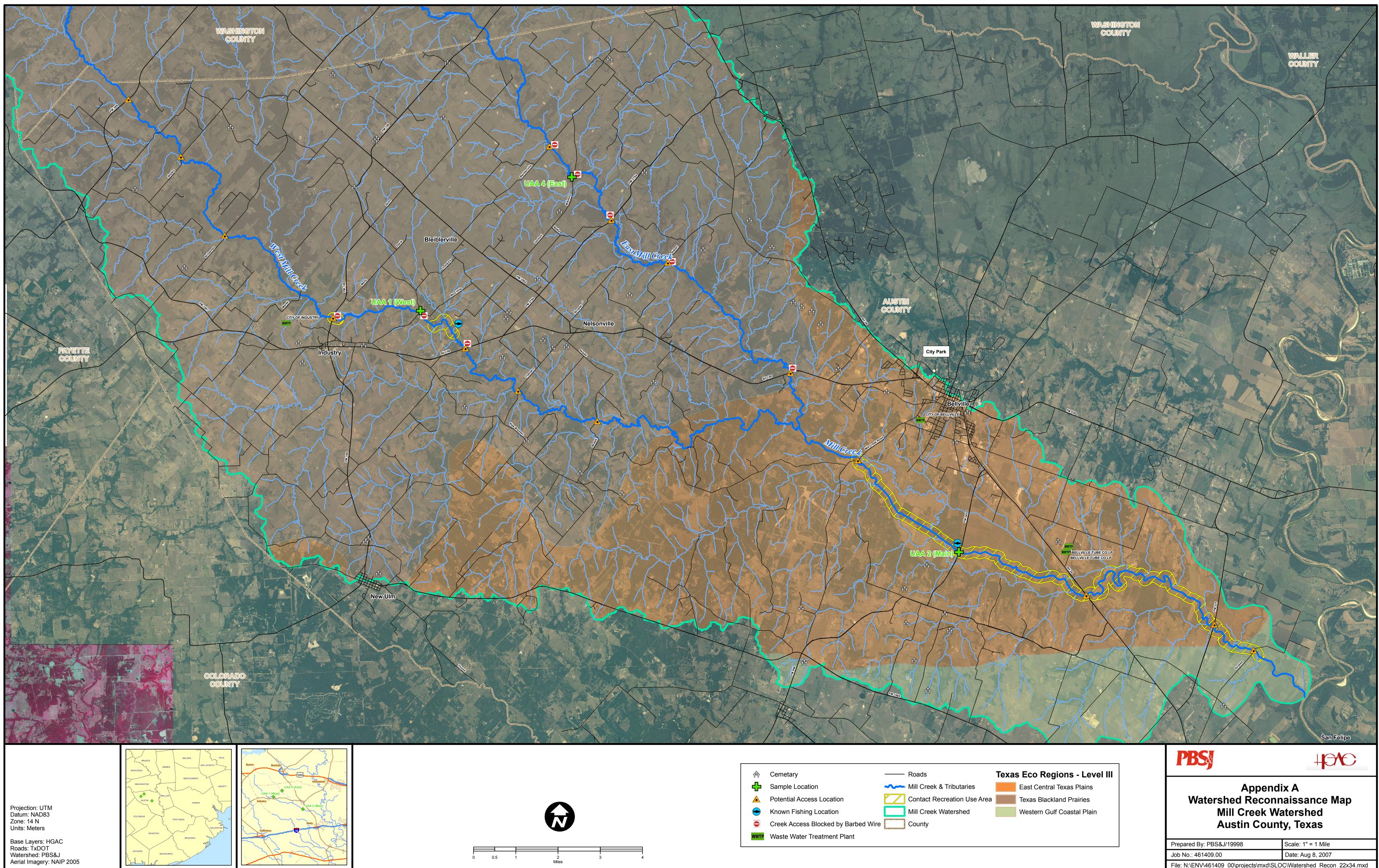
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_____. 2007. Ecological Regions of Texas. Available on the Internet: http://www.tpwd.state.tx.us/ huntwild/wild/birding/pif/assist/pif_regions/.

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Appendix A

Watershed Reconnaissance



Prepared By: PBS&J/19998	Scale: 1" = 1 Mile
Job No.: 461409.00	Date: Aug 8, 2007
File: N:\ENV\461409_00\projects\mxd\SLO	C\Watershed Recon 22x34.mxd

Appendix B

Representative Photographs from the Watershed Reconnaissance



Watershed reconnaissance: Mill Creek at the FM 2429 bridge.



Source of waste water discharge: Town of Industry waste water treatment plant.





Dry weather conditions: West Fork of Mill Creek, upstream of the bridge on Industry Road at Blue Hole Road.



Wet weather conditions: Same site as above.





Possible source of bacteria: Outfall structure for the City of Bellville; located on Boggy Creek, a tributary to Mill Creek.



Impediment to contact recreation: Fencing across east fork of Mill Creek on Bleiblerville Road.





Evidence of human recreational use: Picnic area next to drainage ditch in town of Bellville.



Land use: Rangeland located near East Fork Mill Creek.



Appendix C

SLOC Forms

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY SWQM STATION LOCATION REQUEST FORM

CHECK ACTION REQUIRED:	[X] Add	New Sta	tion]] Ch	ange	Exi	sting	s Sta	tion					
Requestor Name: Marisa Weber		Region	or Agency	y Name	P	Program Area: [X]SWQM []CRP []TMDL []WQA								WQA					
Contact Phone # : (713) 529-4134] [[] Standards [X] Other (please note) UAA ~ Pilot Study													
SAMPLING [HG] INFORMATION		M Databa RCE COE		[PB]		SWQM Database[SS]SWQM DatabaseSOURCE CODE 2PROGRAM CODE													
NEAREST DOWNSTREAM SEQ	UENCE #	#: 11576			N	EAR	EST	UPST	FRE	AM	SEQ	UEN	NCE	: #: 1	1574				
5	STATION	N ID (Red	quired wł	nen mak	ing ch	anges	to ex	istin	g stat	ions)	Ten	npor	ary I	D				
SHORT DESCRIPTION																			
M I L L C K	A	T	F M	2 4	2	9		S	0	f	B	E	L	_ L	. V	/ I	L	L	E
SHORT DESCRIPTION MUST BE LIM	IITED TO	30 CHAR	ACTERS,	BEGIN	VING V	NITH	NAMI	E OF	WAT	ER B	ODY	ζ.							
LONG DESCRIPTION																			
M I L L C K	A	Т	F M	2	4	2	9		5		7	8	k	m		S	of		В
E L L V I L L	E	5.	1 3	k n	n	U	P	S	T	R	E	A	М		0	f		S	Н
3 6 5 . 2	5 k	m	DO	WN	1 S	T	R	E	A	M		0	f		М	Ι	L	L	
C R E E K R	O A	D																	
LONG DESCRIPTION MUST BE LIMI	TED TO 1	35 CHAR	ACTERS,	BEGINN	VING V	VITH	NAMI	EOF	WAT	ER B	ODY	ζ.							
USGS GAGE NUMBER				EPA T	YPE:		S	Т	R	E	A	N	1			L	evei	L 1	
8 1 1 1 7 0 0							A	M	1 B	N	Т					L	EVEI	2	
LOCATION DATA							N	/	A							L	EVEI	3	
TCEQ REGION: 1	2						N	/	A		1	Ì				L	EVEI	_ 4	
BASIN: 1	2						N	/	A	1	1					L	EVEI	5	
			CHE	CK IF S	TATI	ON IS	5 <u>ON</u>	OR <u>(</u>	OFF (CLA	SSIF	FIED	TCI	EQ SI	EGM	ENT	IF S	ΓΑΤΙ	ON IS
			OFF	SEGMI	ENT, I	DESIG	JNAT	'E NI	EARI	EST	DOV	VNS	TRE	EAM	CLAS	SSIFI	ED S	EGM	IENT.
SEGMENT: 1	2 0	2K				ON	X			*	OF	F							
TRACS COUNTY CODE: 0	8]	LATI	TUDE	:			2	9	Í	•	8	9	e	,	7	9
									ĩ				DE	CIMA	L DE	GRE	ES		
ECOREGION CODE: 3	3]	LONC	ITUE	E:		-	9		6	•	2	5			9	9
										T	1			CIMA	I	GREI	ES		T
	W WAS I								GPS	X			T	ropc) [DOO	QQ X
WA	S GPS OI							1.1	ES	X				NO					
STREAM SEQUENCE #:		WDM8	EA STAF			APLE	TE TI	HIS S	SECT	ION	1				F	REAC	TH:		Ι
MILE POINT:						NIC			EE D	DOT		TEE							
	<u>I I</u>		UTEC	K IF ST	ON	i.		K U	FF D	OF	1	TED	EPA	A KE	ACH				
ENTERED IN TRACS BY:						D	ATE	ENT	ERE	D:									

TCEQ-20058 (Rev. 08-10-2005)



Mill Creek at FM 2429 looking upstream



Mill Creek at FM 2429 looking downstream

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY SWQM STATION LOCATION REQUEST FORM

CHECK ACTION REQUIRED: [X]A	dd New Station			[] Chang	ge Exis	sting Sta	ation					
Requestor Name: Marisa Weber	Region or Agency	y Name:	Program Area: [X]SWQM []CRP []TMDL []WQA										
Contact Phone # : (713) 529-4134			[] Standards [X] Other (please note) UAA ~ Pilot Study										
	[HG] SWQM Database [PB] SOURCE CODE 1				SWQM Database[SS]SWQM DatabaseSOURCE CODE 2PROGRAM CODE								
NEAREST DOWNSTREAM SEQUENC	E #: 11574		NEARE	EST UPS	TREAM	SEQ	UENCI	E #: n	/a				
STATI	; changes	to existir	ng station	s)	Tempo	rary	ID _						
SHORT DESCRIPTION	I I I I I												
WEST FORH	M I L	L	C K	A	T	Ι	N 1	DU	JS	Т	R	Y	rd
SHORT DESCRIPTION MUST BE LIMITED	O 30 CHARACTERS,	BEGINNIN	IG WITH N	NAME OF	WATER	BODY							
LONG DESCRIPTION													
W E S T F O R H		L	CK	A	Т	I	N D	U	S	Т	R	Y	
R D - B L U E H (N T		S E	CT		O N	Ļ	3		3	8	k
m D O W N S T H	E A M	O F	S	H	1 0	9		<u> </u>					
LONG DESCRIPTION MUST BE LIMITED TO	135 CHARACTERS,	BEGINNIN	G WITH N	JAME OF	WATER	BODY							
USGS GAGE NUMBER	1	EPA TYP	E:	S T	RI	E A	. M			LE	EVEL	1	
8 1 1 1 7 0 0				A N	ИВИ	N T				LE	EVEL	2	
LOCATION DATA				N /	A					LE	EVEL	3	
TCEQ REGION: 1 2				N /	A	1				LE	VEL	4	
BASIN: 1 2				N /	A					LE	VEL	5	
	CHE	CK IF STA	TION IS	ONOR	OFF CLA	ASSIF	TIED TC	EOS	EGMI	ENT: I	IF ST.	ATIC	DN IS
	OFF	SEGMEN	T, DESIG	NATE N	EAREST	DOW	VNSTRI	EAM	CLAS	SSIFIE	ED SE	EGM	ENT.
SEGMENT: 1 2 0	2K		ON	11		OFI	F X						
TRACS COUNTY CODE: 0 8		LA	TITUDE:		2	9		9	8	3	8	8	
							DE	ECIMA		GREE	-		
ECOREGION CODE: 3 3		LO	NGITUD	E:	- 9	e	5 •	4	6	5	3	6	
					1	I	DE	ECIMA	AL DE	GREE	S		T
HOW WAS	LAT/LONG DETE	RMINED	?		GPS 2	x	-	TOPC	L		I	DOQ	Q X
WAS GPS	OPERATOR TCEQ	CERTIFIE	ED ?	Y	YES X			NO					
	WDM&A STAF	F WILL C	OMPLET	TE THIS	SECTIO	N						2	
STREAM SEQUENCE #:	HU	IC:							R	EACI	H:		
MILE POINT:	CHECK	K IF STAT	TION IS (ON OR O	FF DESI	GNA	TED EP	ARE	ACH	:			
	en e	(on L		OF	FF L							
ENTERED IN TRACS BY:			DA	TE ENT	TERED:								

TCEQ-20058 (Rev. 08-10-2005)



West Fork Mill Creek at Industry Rd looking upstream 5.24.07



West Fork Mill Creek at Industry Rd looking upstream 5.28.07



West Fork Mill Creek at Industry Rd looking downstream 5.24.07



West Fork Mill Creek at Industry Rd looking downstream 5.28.07

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY SWQM STATION LOCATION REQUEST FORM

SH ŞH SH HOL BOCHTON REQUEST FORM
CHECK ACTION REQUIRED: [X] Add New Station [] Change Existing Station
Requestor Name: Marisa Weber Region or Agency Name: Program Area: [X] SWQM [] CRP [] TMDL [] WQA
Contact Phone # : (713) 529-4134 [] Standards [X] Other (please note) UAA ~ Pilot Study
SAMPLING [HG] SWQM Database [PB] SWQM Database [SS] SWQM Database INFORMATION SOURCE CODE 1 SOURCE CODE 2 PROGRAM CODE
NEAREST DOWNSTREAM SEQUENCE #: 11574 NEAREST UPSTREAM SEQUENCE #: n/a
STATION ID (Required when making changes to existing stations) Temporary ID
SHORT DESCRIPTION
E A S T F O R K M I L L C K A T M I K E S K A r d
SHORT DESCRIPTION MUST BE LIMITED TO 30 CHARACTERS, BEGINNING WITH NAME OF WATER BODY.
LONG DESCRIPTION
E A S T F O R K M I L L C K A T M I K E S K A R
D 5 . 7 9 k m N o f S H 1 5 9 - S H 2 5 0 2 I N T
LONG DESCRIPTION MUST BE LIMITED TO 135 CHARACTERS, BEGINNING WITH NAME OF WATER BODY.
USGS GAGE NUMBER EPA TYPE: S T R E A M LEVEL 1
8 1 1 1 7 0 0 A M B N T LEVEL 2
LOCATION DATA N / A LEVEL 3
TCEQ REGION: 1 2 N / A LEVEL 4
BASIN: 1 2 N / A LEVEL 5
CHECK IF STATION IS <u>ON</u> OR <u>OFF</u> CLASSIFIED TCEQ SEGMENT: IF STATION IS OFF SEGMENT, DESIGNATE NEAREST DOWNSTREAM CLASSIFIED SEGMENT.
SEGMENT: 1 2 0 2K ON OFF X
TRACS COUNTY CODE: 0 8 LATITUDE: 3 0 • 0 2 8 6 8
ECOREGION CODE: 3 3 LONGITUDE: - 9 6 • 4 0 4 4 3
ECOREGION CODE: <u>3</u> LONGITUDE: <u>- 9 6 • 4 0 4 4 3</u> DECIMAL DEGREES
HOW WAS LAT/LONG DETERMINED ? GPS X TOPO DOQQ X
WAS GPS OPERATOR TCEQ CERTIFIED ? YES X NO
WDM&A STAFF WILL COMPLETE THIS SECTION
STREAM SEQUENCE #: HUC: REACH: REACH:
MILE POINT: CHECK IF STATION IS ON OR OFF DESIGNATED EPA REACH:
ON OFF
ENTERED IN TRACS BY: DATE ENTERED:

TCEQ-20058 (Rev. 08-10-2005)



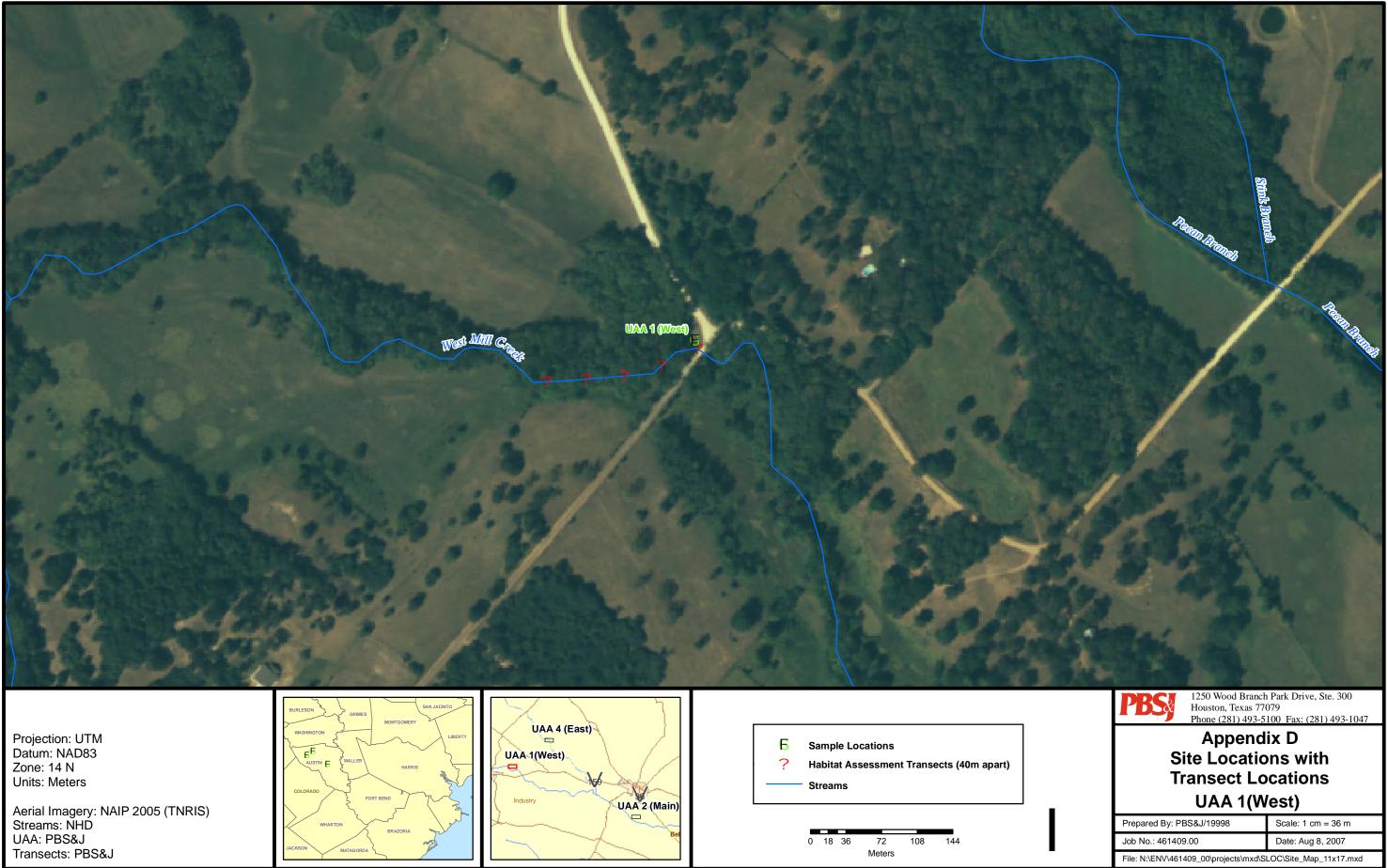
East Fork Mill Creek at Mikeska Rd looking upstream



East Fork Mill Creek at Mikeska Rd looking downstream

Appendix D

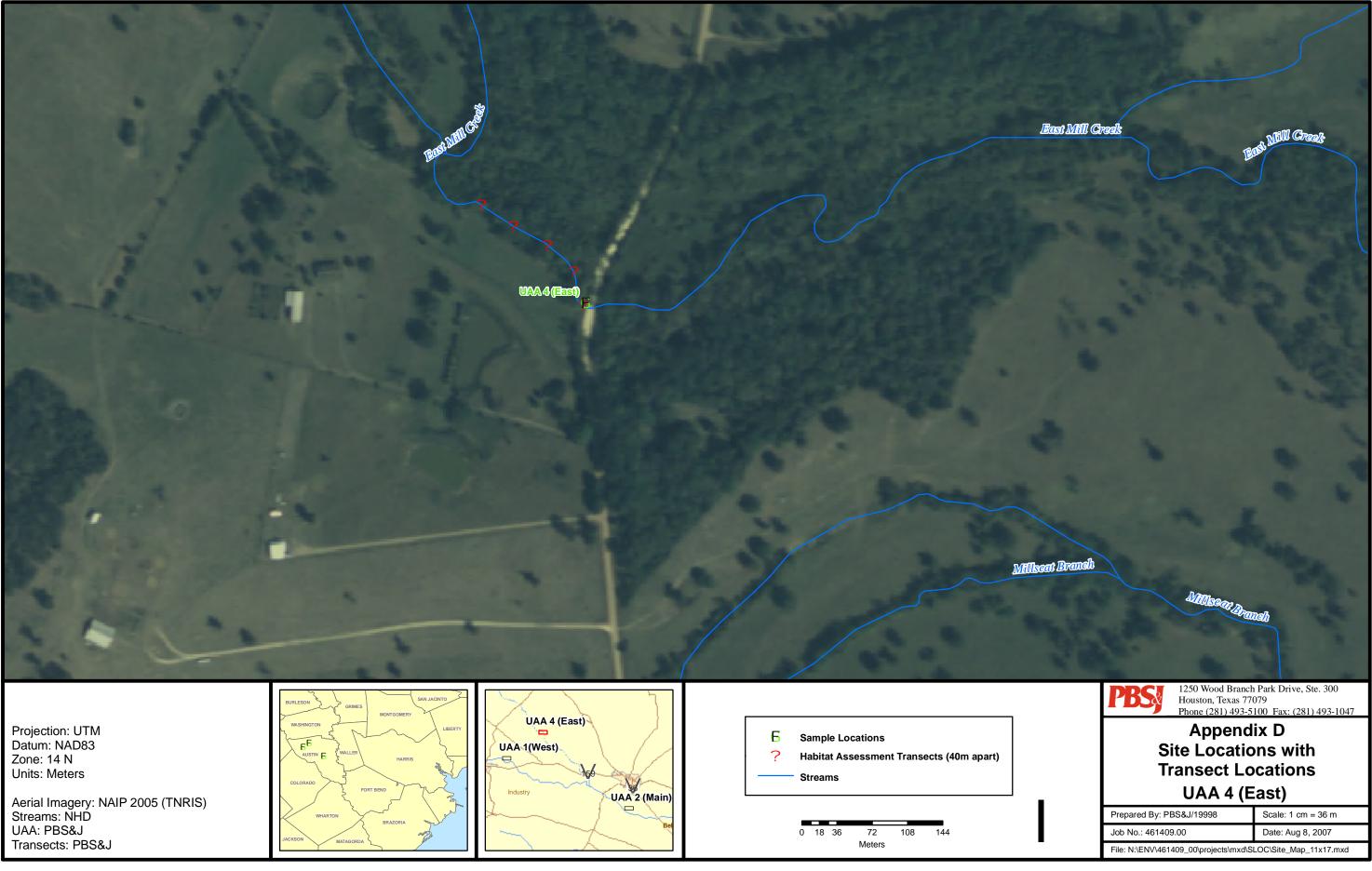
Site Map with Transect Locations





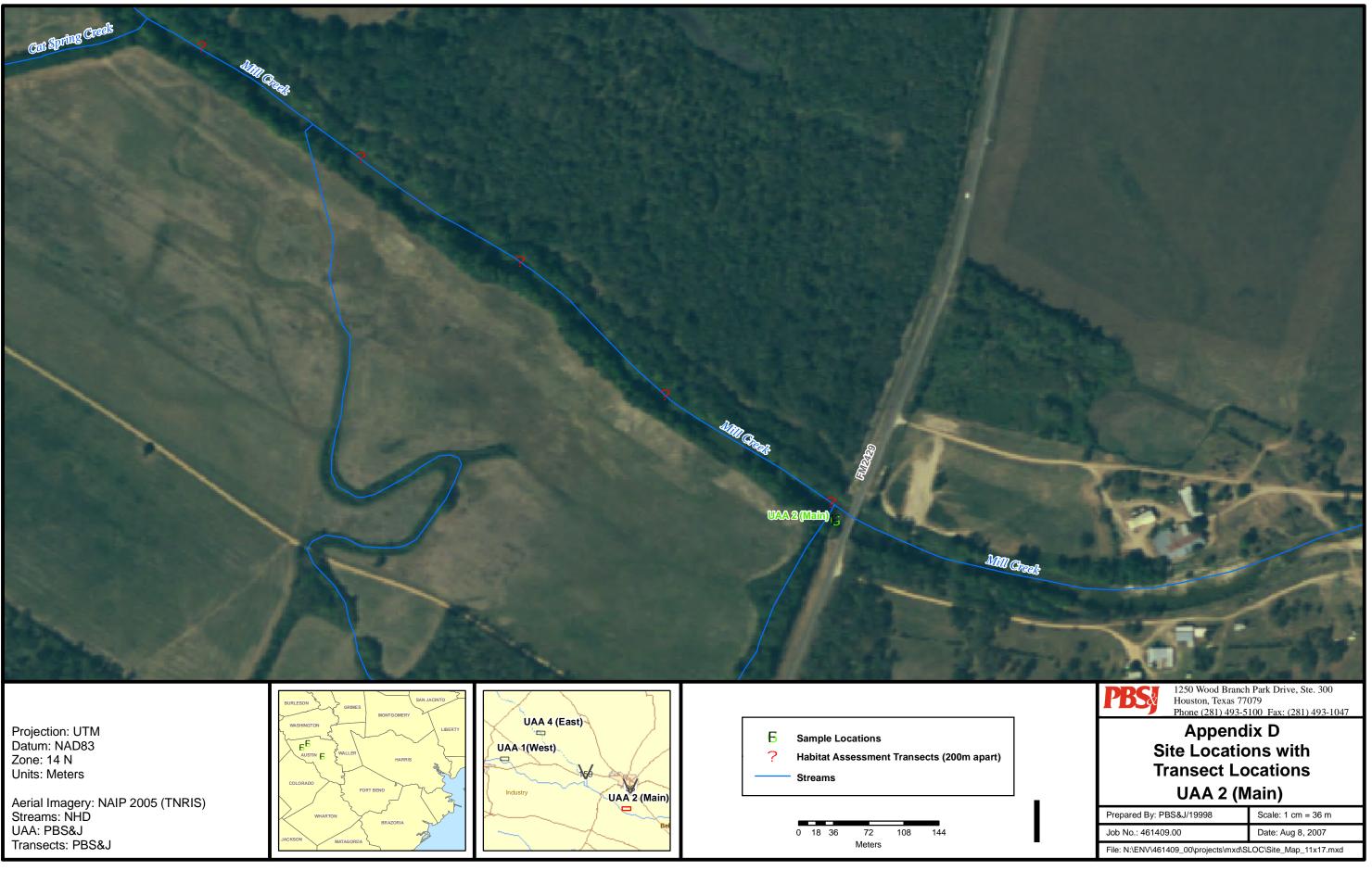


6 ?	Sample Locations Habitat Assessment Transects (40m apart) - Streams
	0 18 36 72 108 144





6 ?	Sample Locations Habitat Assessment Transects (40m apart) Streams







6 ?	Sample Locations Habitat Assessment Transects (200m apart) Streams
	0 18 36 72 108 144

Appendix E

Representative Photographs from the Habitat Assessment

Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA1 (West Fork): Transect 1, Facing upstream.



UAA1 (West Fork): Transect 1, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA1 (West Fork): Transect 2, Facing upstream.



UAA1 (West Fork): Transect 2, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA1 (West Fork): Transect 3, Facing upstream.



UAA1 (West Fork): Transect 3, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA1 (West Fork): Transect 4, facing upstream.



UAA1 (West Fork): Transect 4, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA1 (West Fork): Transect 5, Facing upstream.



UAA1 (West Fork): Transect 5, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA2 (Mill Creek): Transect 1, facing upstream.



UAA2 (Mill Creek): Transect 1, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA2 (Mill Creek): Transect 2, Facing upstream.



UAA2 (Mill Creek): Transect 2, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA2 (Mill Creek): Transect 3, facing upstream.



UAA1 (West Fork): Transect 3, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA2 (Mill Creek): Transect 4, Facing upstream.



UAA2 (Mill Creek): Transect 4, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA2 (Mill Creek): Transect 5, facing upstream.



UAA2 (Mill Creek): Transect 5, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA4 (East Fork): Transect 1, facing upstream.



UAA4 (East Fork): Transect 1, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA4 (East Fork): Transect 2, facing upstream.



UAA4 (East Fork): Transect 2, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA4 (East Fork): Transect 3, facing upstream.



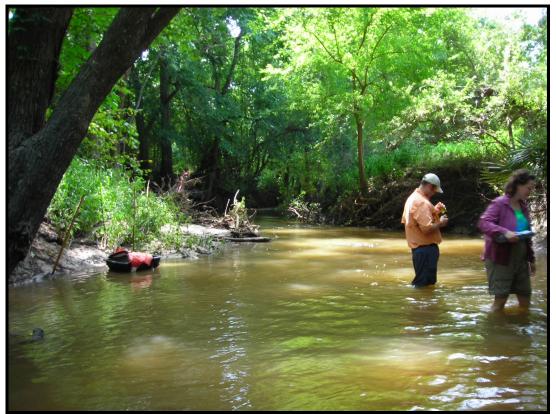
UAA4 (East Fork): Transect 3, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA4 (East Fork): Transect 4, facing upstream.



UAA4 (East Fork): Transect 4, facing downstream.



Mill Creek Habitat Assessment and Physical Stream Characteristics Study Austin County, Texas



UAA4 (East Fork): Transect 5, facing upstream.

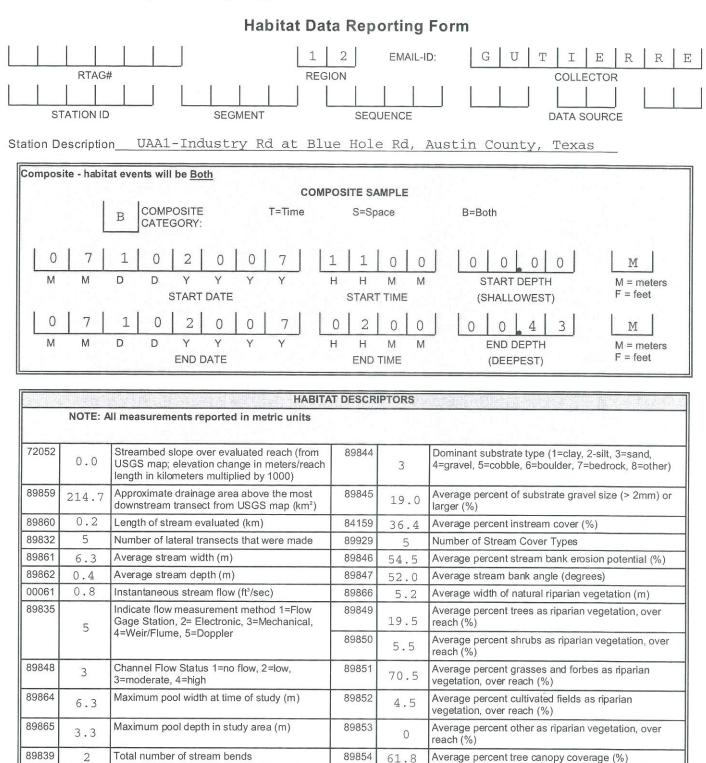


UAA4 (East Fork): Transect 5, facing downstream.



Appendix F

Habitat Assessment Forms



89867

84161

89961

89962

2

2

1

2

4=offensive)

Stream Order

3=moderate, 4=high)

1

1

0

2

Number of well defined stream bends

Number of poorly defined stream bends

Total number of riffles

Number of moderately defined stream bends

89840

89841

89842

89843

Aesthetics (1=wilderness, 2=natural, 3=common,

Land Development Impact (1=unimpacted, 2=low,

Ecoregion (Texas Ecoregion Code)

Habitat Assessment Worksheet B Part I of III

Worksheet #UAA	4		Deall							
			Part I -	Stream	m Physica	I Chara	cteristics Work	csheet		Page 1 of <u>3</u>
Observers: Gutierr					Date: 7/1	0/2007	Time: 11:00 ar	n		
Weather conditions		у			2					
Stream: West fork	Mill Creek				Stream s	egment	no. UAA1			
Location of site: Inc	dustry Rd @ B	lue Hole	Rd			Length	of reach:	160m		
Observed stream u	ises:		None							
Stream type (circle	one): peren	nial	01		intermitt	ent w/ p	perennial pools	;		
Stream bends: 2		No. defi	well ned	1	No. mode defined	erately	1	No. poorly de	fined	0
Aesthetics (circle o	one):		(1) wildernes	SS	<u>(2) natur</u>	al	(3) common	(4) offens	sive	
Channel obstructio	ns or modifica	tions: 2 o	bstructions (d	owned	d trees)		No. of riffles	2		
Channel flow status	s (circle one):		ł	nigh	mode	rate	low	no flow	1	
Riparian vegetation	ו (%):		Left Bank	Righ	nt Bank			Notes		
Trees			20		19	l R	iparian zone			
Shrubs			10		1	1	widths	LB	RB	
Grasses o	or forbs		70		71	1	T1	>20m	>20m	
Cultivated	fields		0		9	1	T2	>20m	30 ft then rd	
Other			0		0	1	Т3	>20m	50ft	
Site map:						1	T4 T5	>20m	50ft	
WQD @ 14:07 Temp 2 Sal 0 Cond 0 DO%/mg/L 8	28.68 0.23 0.483 32.1/6.33 7.57					Wildlif pileated barred hawk (a	T5 st pool – 3.3 ft d e observed - d woodpecker (a owl (aural) aural) (visual)	>20m leep/6.3 ft wide	50ft	

Worksheet #UAA1			Part I - 9	Stream Ph	Physic	sal Cha	ysical Characteristics Worksheet (continued)	tics Wo	rkshee	it (conti	nued)				Page _2 of _3	മ	
Location of transect	Stream width (m)	Left bank slope (E)	Left bank erosion potential (%)			õ	Stream Depths (#) (ft) at Points Across Transect Thalweg Depth: Flow (ft/s)	is (m) (ft) ; Thalwe; Flow	(ft) at Points A Thalweg Depth: Flow (ft/s)	vcross Tran	isect			Right bank slope (E)	Right bank erosion potential (%)	Tree canopy (%) 8.8	, don
UAAI	13'2"	64	30	0.8	1.0 0.21	1.2 0.35	1.4 0.72	1.4 1 0.88 0	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	1.4 1.3 0.86 0.74	3 1.4 4 0.72	2 1.3 0.39	0.9	46	20	Total	9
T1	Habitat type (circle one) Riffle Run Clide Pool	e (circle one) <u>Run</u> Pool	Dominant substrate type Cobble (from bridge construction)	strate type vridge cons	truction)		Dominant Left bank:	Dominant types riparian vegetation: Left bank: peppervine, morning glor	rian vegeta e, morning	Dominant types riparian vegetation: Left bank: peppervine, morning glory, berry vines	ry vines				% Gravel or larger	CL	1
					8		Right bank	Right bank: peppervine	ine						06	CR	5
Macrophytes (circle one)	Algac (circle one)	one)	Width of natural buffer vegetation (m)	al buffer v	egetation (Instream cover types:	types:							% Instream	LB	-
Rare Absent	Rare	Absent	LB: 50ft	RB: >20	RB: >20m/next to rd		cobble, some vegetation	egetation							cover 80	RB	2
Location of	Stream width	Left bank	Left bank erosion			St	Stream Depths (#) (ft) at Points Across Transect	s (m) (ft) â	t Points A	cross Tran	sect			Right bank	Right bank erosion	Tree canopy (%)	nopy (
transect	(II)	slope (E)	potential (%)					Thalwe	Thalweg depth: Flow (ft/s)					slope (E)	potential (%)	64.7	2
T2	18'5'	45	40	1.0 -0.7	2.0 -0.4	2.25 -0.34	2.5 0.35 (2.5 2 0.21 0.	2.5 2. 0.30 0.3	2.4 2.0 0.28 0.26) 1.5 6 0.17	0.07	0.5	75	60	Total	44
	Habitat type (Circle One) Riffle Run	Circle One) Run	Dominant substrate type	trate type			Dominant types ripa Left bank: boxelder	Dominant types riparian vegetation: Left bank: boxelder	ian vegeta	tion:					% Gravel or larger	СГ	П
	त्मावह	Pool	Scoured clay w/roots	/roots			Right bank	Right bank: ash, poison ivy, peppervine	on ivy, pel	opervine					0	CR	10
Macrophytes (circle one) Abundant Common	Algac (circle one) Abundant C	one) Common	Width of natural buffer vegetation (m)	al buffer ve	sgetation (Instream cover types:	types:							% Instream	LB	11
	Rare	Abseut	LB: >20m	RB: 5ft		IOC	roots, limbs								15	RB	12
Location of Transect	Stream width (m)	Left bank slope (E)	Left bank erosion potential (%)			St	Stream Depths (#) (ft) at Points Across Transect Thalweg depth:	s (m) (ft) a Thalweg	#) (ft) at Points A.Thalweg depth:	cross Tran	sect			Right bank slope (E)	Right bank erosion potential (%)	Tree canopy (%) 72.1	Nopy
T3	23'6"	40	50	0.8 0.17	1.2 0.31	$ \frac{1.3}{0.30} $	1.4 0.30 C	Flow (ft/s) 1.6 1.5 0.34 0.29		1.3 1.3 0.28 0.26	0.18	0.9 0.15	0.7 0.12	67.5	50	Total	49
	Habitat type (circle one) Riffle Run	circle one) Run	Dominant substrate type	trate type			Dominant types riparian vegetation: Left bank: poison ivy, greenbrier	types ripar poison ivy,	ian vegeta	tion: T					% Gravel or larger	СГ	14
	Glide	Pool	ninge				Right bank: dogwood, grape vines	: dogwood	, grape vir	les					0	CR	11
Macrophytes (circle one) Abundant Common	Algac(circle one) Abundant C	one) Common	Width of natural buffer vegetation (m)	ll buffer ve	getation (1		Instream cover types:	types:							% Instream cover	LB	12
Rare Absent	Rare	Absent	LB: >20m	RB: 3ft		roots	ts								12	RB	12
TCEQ 20156-A (Rev. 4-14-2005)	-2005)]

Worksheet #UAA1			Part I - 9	Stream Physical Characteristics Worksheet (continued)	sical Ch	aracteristi	cs Work	sheet (sontinu	ed)				Page	3 of 3	
Location of transect	Stream width (m)	Left bank slope (E)	Left bank erosion potential (%)			Stream Depths (m) (ft) at Points Across Transect Thalweg Depth: Flow (ft/s)	(m) (ft) at Points Thalweg Depth: Flow (ft/s)	oints Acros epth: (s)	s Transect				Right bank slope (E)	Right bank erosion potential (%)	Tree canopy (%) 83.8	anopy () 8.
UAA1	24'8''	39	65	1.2 1.2 0.85 0.60	2 1.0 0 0.79	1.1 0 0.74 0.	0.8 0.7 0.69 0.66	0.6 0.70	0.4 0.13	0.0 0.0	0.0	0.3 0.29	48	75	Total	57
Τ4	Habitat type (circle one) Riffle <u>Run</u> Glide <u>Pool</u>	circle one) <u>Run</u> Pool	Dominant substrate type Sand	trate type		Dominant ty Left bank: p	Dominant types riparian vegetation: Left bank: poison ivy, Indian sea-oats, greenbrier	vegetation Idian sea-o	ats, greenb	rier				% Gravel or larger	CL	14
						Right bank:	Right bank: ash, boxelder, grape vines	ır, grape vii	les					5	CR	14
Macrophytes (circle one)	Algac (circle one)	one)	Width of natura	Width of natural buffer vegetation (m)		Instream cover types:	pes:							% Instream	LB	13
Rare Absent	Rare	Absent	LB: >20m	RB: 3ft	LIOC	roots, woody debris, Chinese-tallow seedlings on sandbar	is, Chinese-	tallow seed	lings on sa	ndbar				cover 45	RB	16
Location of	Stream	Left bank	Left bank erosion		01	Stream Depths (m) (ft) at Points Across Transect	(m) (ft) at P	oints Acros	s Transect				Right bank	Right bank erosion	Tree canopy (%)	unopy ()
n anscel	(III)	stope (E)	росепцал (%)				Thalweg depth: Flow (ft/s)	epth: s)					slope (E)	potential (%)	79.4	4
T5	23'3"	53	06	1.0 1.3 0.30 0.47	3 0.9 7 0.59	0.9 0 0.75 0.	0.8 0.7 0.06 0.06	0.8 0.64	0.7 0.78	0.8 0.48	0.6 0.26	0.4 0.09	43	65	Total	54
	Habitat type (Circle One) Riffle Run	Circle One) Run	Dominant substrate type	rate type		Dominant types riparian vegetation: Left bank: ash. Indian sea-oais	pes riparian sh. Indian se	vegetation: a-oats						% Gravel or larger	CL	14
	Glide	Pool				Right bank: sycamore	sycamore							0	CR	13
Macrephytes (circle one) Abundant Common	Algac(circle one) Abundant C	one) Common	Width of natura	Width of natural buffer vegetation (m)		Instream cover types:	es:							% Instream	LB	12
	Rare	Abseut	LB: >20m	RB: 25ft	IOO	roots, woody debris	IS.							30	RB	15
Location of transect	Stream width (m)	Left bank slope (E)	Left bank erosion potential (%)		S	Stream Depths (m) (ft) at Points Across Transect Thalweg depth: Flow (ft/s)	(m) (ft) at Points Thalweg depth: Flow (ft/s)	oints Acros pth: s)	s Transect				Right bank slope (E)	Right bank erosion potential (%)	Tree canopy (%)	, (
															Total	
	Habitat type (circle one) Riffle Run	circle one) Run	Dominant substrate type	rate type	180	Dominant types riparian vegetation: Left bank:	pes riparian	vegetation:						% Gravel or larger	CL	
	Glide	Pool				Right bank:									CR	
Macrophytes (circle one) Abundant Common	Algae (sucle one) Abundant	ne) Common	Width of natura	Width of natural buffer vegetation (m)	1 1	Instream cover types:	es:							% Instream	LB	
Rare Absent	Rare	Absent	LB:	RB:										00401	RB	
TCEQ 20156-A (Rev. 4-14-2005)	-2005)															

TCEQ 20156-A (Rev. 4-14-2005)

Habitat Assessment Worksheet B Part II of III

Using information from all of the transects and measurements in Part I and other characteristics or averages for the entire reach:	sources, report the following genera
Stream Name West fork Mill Creek (UAA1)	Date 7/10/2007
Physical Characteristics	Value
Stream bed slope over evaluated reach (from USGS map; elevation change in meters/reach length in meters)	0
Approximate drainage area above the transect furthest downstream (from USGS or county highway map in km ²)	214.7
Stream order	2
Length of stream evaluated (in meters or kilometers)	160m
Number of lateral transects made	5
Average stream width (in meters)	6.28
Average stream depth (in meters)	0.35
Instantaneous stream flow (in ft ³ /sec)	0.8
Indicate flow measurement method	Doppler
Channel flow status (high, moderate, low, or no flow)	Moderate
Maximum pool width (in meters)	1.9
Maximum pool depth (in meters)	1.1
Total number of stream bends	2
Number of well defined bends	1
Number of moderately defined bends	1
Number of poorly defined bends	0
Total number of riffles	2
Dominant substrate type	Sand
Average percent of substrate gravel sized or larger	19.0
Average percent instream cover	36.4
Number of stream cover types	5
Average percent stream bank erosion potential	54.5
Average stream bank slope (in degrees)	52
Average width of natural buffer vegetation (in meters)	5.2
Average riparian vegetation percent composition by: (total to equal 100%)	
Trees	19.5
Shrubs	5.5
Grasses and Forbes	70.5
Cultivated fields	4.5
Other	0
Average percent tree canopy coverage	61.8
Overall aesthetic appraisal of the stream	Natural

Habitat Assessment Worksheet B Part III of III UAA1

Habitat Parameter		Scoring Ca	tegory	
Available Instream Cover	Abundant >50% of substrate favorable for colonization and fish cover; good mix of several stable (not new fall or transient) cover types such as snags, cobble, undercut banks, macrophytes	Common 30-50% of substrate supports stable habitat; adequate habitat for maintenance of populations; may be limited in the number of different habitat types	Rare 10-29.9% of substrate supports stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed	Absent <10% of substrate supports stable habitat; lack of habitat is obvious; substrate unstable or lacking
Score <u>3</u>	4	3	2	1
Bottom Substrate Stability	Stable >50% gravel or larger substrate; gravel, cobble, boulders; dominant substrate type is gravel or larger	Moderately Stable 30-50% gravel or larger substrate; dominant substrate type is mix of gravel with some finer sediments	Moderately Unstable 10-29.9% gravel or larger substrate; dominant substrate type is finer than gravel, but may still be a mix of sizes	Unstable <10% gravel or larger substrate; substrate is uniform sand, silt, clay or bedrock
Score 2	4	3	2	1
Number of Riffles To be counted, riffles must extend >50% the width of the channel and be at least as long as the channel width	Abundant ≥ 5 riffles	Common 2-4 riffles	Rare 1 riffle	Absent No riffles
Score <u>3</u>	4	3	2	1
Dimensions of Largest Pool	Large Pool covers more than 50% of the channel width; maximum depth is >1 meter	Moderate Pool covers approximately 50% or slightly less of the channel width; maximum depth is 0.5-1 meter	Small Pool covers approximately 25% of the channel width; maximum depth is <0.5 meter	Absent No existing pools; only shallow auxiliary pockets
Score <u>4</u>	4	3	2	1
Channel Flow Status	High Water reaches the base of both lower banks; < 5% of channel substrate is exposed	Moderate Water fills >75% of the channel; or <25% of channel substrate is exposed	Low Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed	No Flow Very little water in the channel and mostly present in standing pools; or stream is dry
Score2	3	2	1	0

Part III - Habitat Quality Index

UAA1 Part III - Habitat Quality Index (continued)

Habitat Parameter		Scoring Ca	tegory	
Bank Stability	Stable Little evidence (<10%) of erosion or bank failure; bank angles average <30□	Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average 30-39.9□	Moderately Unstable Evidence of erosion or bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60	Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60□
Score1	3	2	1	0
Channel Sinuosity	High ≥ 2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) present	Moderate 1 well-defined bend <u>or</u> ≥ 3 moderately- defined bends present	Low <3 moderately- defined bends <u>or</u> only poorly-defined bends present	None Straight channel; may be channelized
Score <u>2</u>	3	2	1	0
Riparian Buffer Vegetation	Extensive Width of natural buffer is >20 meters	Wide Width of natural buffer is 10.1-20 meters	Moderate Width of natural buffer is 5-10 meters	Narrow Width of natural buffer is <5 meters
Score1	3	2	1	0
Aesthetics of Reach	Wilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptional	Natural Area Trees and/or native vegetation are common; some development evident (from fields, pastures, dwellings); water clarity may be slightly turbid	Common Setting Not offensive; area is developed, but uncluttered such as in an urban park; water clarity may be turbid or discolored	Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbid or discolored
Score <u>2</u>	3	2	1	0
Total Score20HABITAT QUALITY IN $26 - 31$ $26 - 31$ Exceptional $20 - 25$ High $14 - 19$ Intermediate ≤ 13 Limited	DEX		-	

Gage Station, 2= Electronic, 3=Mechanical,

Channel Flow Status 1=no flow, 2=low,

Maximum pool width at time of study (m)

Maximum pool depth in study area (m)

Number of well defined stream bends

Number of poorly defined stream bends

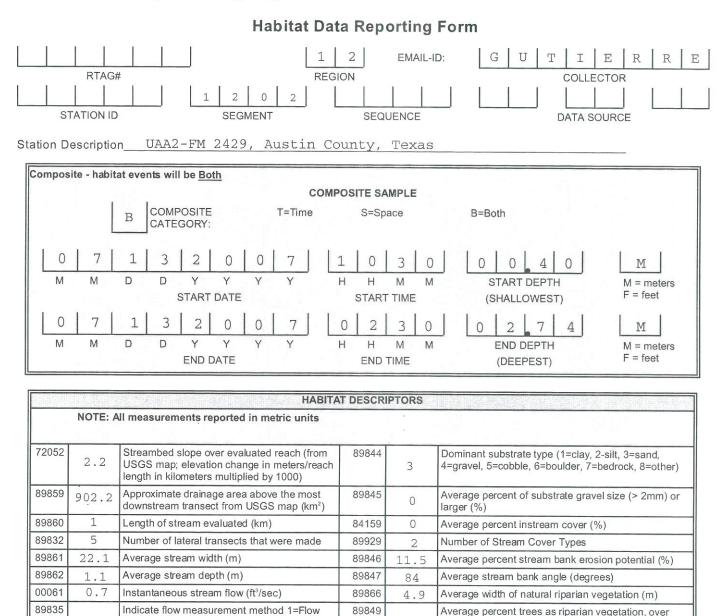
Number of moderately defined stream bends

Total number of stream bends

Total number of riffles

4=Weir/Flume, 5=Doppler

3=moderate, 4=hiah



34

12

45

0

9

73

2

4

1

2

89850

89851

89852

89853

89854

89867

84161

89961

89962

reach (%)

reach (%)

reach (%)

4=offensive)

Stream Order

3=moderate, 4=high)

vegetation, over reach (%)

vegetation, over reach (%)

Average percent shrubs as riparian vegetation, over

Average percent grasses and forbes as riparian

Average percent other as riparian vegetation, over

Aesthetics (1=wilderness, 2=natural, 3=common,

Land Development Impact (1=unimpacted, 2=low,

Average percent cultivated fields as riparian

Average percent tree canopy coverage (%)

Ecoregion (Texas Ecoregion Code)

5

3

1.2

2.7

2

0

0

2

0

89848

89864

89865

89839

89840

89841

89842

89843

Habitat Assessment Worksheet B Part I of III

Worksheet #UAA2		Part I - S	Strear	n Physica	l Chara	cteristics Work	sheet	Page 1 of <u>3</u>
Observers: Gutierrez, Hardin, Ma	irshall			Date: 7/1	3/2007	Time: 10:30 ar	n	
Weather conditions: Partly cloud	y, hot							
Stream: Mill Creek				Stream s	egment	no. UAA2		
Location of site: FM 2429					Length	of reach:	1 km	
Observed stream uses:		Fishing (trot li	ne, fis	shing line)	, swimm	ing (rope swing))	
Stream type (circle one): peren	nial	or		intermitt	ent w/ p	perennial pools	(
Stream bends: 2	No. defi	well ned	0	No. mode defined	erately	0	No. poorly defined	2
Aesthetics (circle one):		(1) wildernes	S	<u>(2) natur</u>	al	(3) common	(4) offensive	
Channel obstructions or modifica	tions: 0 c	bstructions; dr	edge	d channel		No. of riffles	0	
Channel flow status (circle one):		h	igh	mode	rate	low	no flow	
Riparian vegetation (%):		Left Bank	Righ	nt Bank			Notes	
Trees		35		33	Larges	st pool – 9.0 ft c	leep/4.0 ft wide	
Shrubs		14		17				
Grasses or forbs		44		45		e observed -		
Cultivated fields		0		0	egret (visual) Ilue heron (visua	al)	
Other		7		12	grouts			
Site map:								

Worksheet #UAA2			Part I - S	Stream Physical Characteristics Worksheet (continued)	hysica	Chare	acteristi	cs Wor	ksheet	(contin	(pen				Page_2 of _3	~	
Location of transect	Stream width (m)	Left bank slope (E)	Left bank erosion potential (%)			Stre (Unsafe 1	am Depths to wade-ol	(m) (ft) at Points d trot lines and ff Thalweg Depth: Flow (ft/s)	Stream Depths (m) (ft) at Points Across Transect (Unsafe to wade-old trot lines and fishing line in stream) Thalweg Depth: Flow (ft/s)	oss Transe ng line in	act stream)			Right bank slope (E)	Right bank erosion potential (%)	Tree canopy (%) 47.1)) 1
UAA2	74'9''	85	5		4.0 0.07			4.0 0.14	0 14			2.2 0.34		85	15	Total	32
T1	Habitat type (circle one) Riffhe Run	circle one) n	Dominant substrate type	rate type			Jominant t. Left bank: I	ypes riparia ndian sea-o	Dominant types riparian vegetation: Left bank: Indian sea-oats, giant ragweed, large elms	on: agweed, k	arge elms				% Gravel or larger	CL	0
	Glide Pool	ol	Sand		2	H	kight bank:	Indian sea	Right bank: Indian sea-oats, poison ivy, very large elm	on ivy, ver	y large eln	_			0	CR	2
Macrophytes (circle one)	Algac (circle one)	ne) Common	Width of natural buffer vegetation (m)	l buffer veg	etation (m)		Instream cover types:	ypes:							% Instream	LB	13
	Rare	Absent	LB: 35ft	RB: 10ft		none									cover 0	RB	17
Location of	Stream width	Left bank	Left bank erosion			Stree	am Depths	(m) (ft) at	Stream Depths (#) (ft) at Points Across Transect	oss Transe	cct			Right bank	Right bank erosion	Tree canopy (%)	nopy (
transect	(m)	slope (E)	potential (%)				Thalweg d	epth: (estimate Flow (ft/s)	Thalweg depth: (estimated with paddle) Flow (ft/s)	paddle)				slope (E)	potential (%)	<i>9.1</i> 7	6
T2	64'2''	75	5		4.0 0.08			5.5 0.10	5 7.5 0 N/A		7.0 N/A	9 0.10		85	10	Total	53
	Habitat type (Circle One) Riffle Run	Circle One) Run	Dominant substrate type	rate type			Dominant ty eft bank: I	ypes riparia ndian sea-c	Dominant types riparian vegetation: Left bank: Indian sea-oats, giant ragweed, elm, 2 large boxelders	m: agweed, e	lm, 2 large	boxelders			% Gravel or larger	cr	14
	Glide	Pool	nuec				tight bank:	giant ragw	Right bank: giant ragweed, boxelder saplings	der sapling	S				0	CR	6
Macrophytes (circle one) Abundant Common	Algat (circle one) Abundant C	ne) Common	Width of natural buffer vegetation (m)	l buffer veg	etation (m)		Instream cover types:	ypes:							% Instream	LB	16
	Rare	Abseut	LB: >20m	RB: 15ft		roots									0	RB	14
Location of Transect	Stream width (m)	Left bank slone	Left bank erosion notential			Stree	am Depths	(m) (ft) at	Stream Depths (#) (ft) at Points Across Transect	oss Transe	ct			Right bank	Right bank erosion	Tree canopy (%)	vdon
		(E)	(%)			Thalv	veg depth:	(covered 90% Flow (ft/s)	Thalweg depth: (covered 90% of the stream width) Flow (ft/s)	tream wid	th)			(E)	potential (%)	89.7	7
Τ3	73°0"	06	10	1.3 0.05	1.5 0.15	1.3 0.05	1.4 1 0.16 0.	1.4 1.9 0.18 0.80	9 2.2 0 0.11	2.6 0.07	2.7 0.06	3.0 0.08	3.5 0.10	85	10	Total	61
	Habitat type (circle one) Riffle Run	ircle one) Run	Dominant substrate type	rate type			ominant ty eft bank: Ir	/pes riparia adian sea-o	Dominant types riparian vegetation: Left bank: Indian sea-oats, large sycamore	n: ycamore					% Gravel or larger	cL	14
	Glide	Pool	Sand			2	light bank:	Indian sea-	Right bank: Indian sea-oats, elm, 2 large sycamores, poison ivy	2 large syc	amores, p	oison ivy			0	CR	15
Macrophytes (circle one) Abundant Common	Algae (circle one) Abundant C	ne) Common	Width of natural buffer vegetation (m)	l buffer veg	etation (m)		Instream cover types:	ypes:							% Instream	LB	16
Rare Absent	Rare	Abseut	LB: 40ft	RB: 20ft		none									0	RB	16
TCEQ 20156-A (Rev. 4-14-2005)	-2005)																

Worksheet #UAA2			Part I - S	stream F	hysica	I Chan	Stream Physical Characteristics Worksheet (continued)	s Works	heet (cc	ntinue	d)				Page	<u>3</u> of <u>3</u>	
Location of transect	Stream width (m)	Left bank slope (E)	Left bank erosion potential (%)			Str	Stream Depths (m) (ft) at Points Across Transect Thalweg Depth: (estimated with paddle) Flow (ft/s)	 a) (ft) at Poin b) (ft) at Poin b) (ft) b) (ft) 	nts Across ed with pad	Transect dle)				Right bank slope (E)	Right bank erosion potential (%)	Tree canopy (%) 80.9	yqon (
UAA2	80'6"	75	5	5.0	5.0	5.0 0.07	4.5 4.5	5.0 0.90	5.5	6.0	6.0 0.14	6.0	5.0	06	5	Total	55
T4	Habitat type (circle one) Riffie Run	circle one) Run	Dominant substrate type	rate type			Dominant types riparian vegetation: Left bank: giant ragweed, Johnson grass	es riparian vo	egetation: Johnson gra	ISS					% Gravel or larger	CL	∞
	Glide	Pool	Sand				Right bank: Indian sea-oats, poison ivy, large sycamore	dian sea-oat	s, poison iv	y, large sy	camore				0	CR	15
es (c	Algae (circle one)	one)	Width of natural buffer vegetation (m)	l buffer veg	etation (m		Instream cover types:	S:							% Instream	LB	17
Rare Absent	Rare	Abseut	LB: >20m	RB: 15ft		Tood	Too deep to walk-no visible cover and no gravel	o visible cov	er and no g	ravel					cover 0	RB	15
Location of	Stream width	Left bank	Left bank erosion			Stre	Stream Depths (#) (ft) at Points Across Transect	a) (ft) at Poi	nts Across	Transect				Right bank	Right bank erosion	Tree canopy (%)	, (
uransect	(III)	stope (E)	potential $(\%)$					Thalweg depth: Flow (ft/s)	th:					slope (E)	potential (%)	67.6	 9
Τ5	0.12	06	30	1.6 0.02	1.6 0.05	1.5 0.11	1.7 1.9 0.10 0.15	5 0.38	2.0 0.38	2.4 0.48	2.9 0.42	2.9 0.46 (3.3 0.45	80	20	Total	46
	Habitat type (Circle One) Riffle Run	Circle One) Run	Dominant substrate type	rate type			Dominant types riparian vegetation: Left bank: Indian sea-oats, ash, elm, sugarberry	es riparian ve ian sea-oats,	egetation: ash, elm, s	ugarberry			-		% Gravel or larger	CL	7
	Glide	Pool	DIBC				Right bank: Indian sea-oats, sycamore, ash	dian sea-oat	s, sycamore	, ash					0	CR	13
Macrophytes (circle one) Abundant Common	Algac (circle one) Abundant C	one) Common	Width of natural buffer vegetation (m)	l buffer veg	etation (m		Instream cover types:								% Instream	LB	Π
	Rare	Abseut	LB: >20m	RB: 20ft		downe	downed tree							_	0	RB	15
Location of uransect	Stream width (m)	Left bank slope (E)	Left bank erosion potential (%)			Stre	Stream Depths (#) (ft) at Points Across Transect Thalweg depth: Flow (ft/s)	 #) (ft) at Points Thalweg depth: Flow (ft/s) 	its Across ' th:	Transect				Right bank slope (E)	Right bank erosion potential (%)	Tree canopy (%)	hopy
																Total	
	Habitat type (circle one) Riffle Run	circle one) Run	Dominant substrate type	rate type			Dominant types riparian vegetation: Left hank:	s riparian ve	getation:						% Gravel or larger	CL	
	Glide	Pool					Right bank:								50	CR	
Macrophytes (circle one) Abundant Common	Algae (sircle one) Abundant C	ine) Common	Width of natural buffer vegetation (m)	buffer veg	etation (m)		Instream cover types:								% Instream	LB	
Rare Absent	Rare	Absent	LB:	RB:												RB	
TCEQ 20156-A (Rev. 4-14-2005)	-2005)																

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Habitat Assessment Worksheet B Part II of III

Stream Name Mill Creek (UAA2)	Date 7/17/2007
Physical Characteristics	Value
Stream bed slope over evaluated reach (from USGS map; elevation change in meters/reach length in meters)	2.2%
Approximate drainage area above the transect furthest downstream (from USGS or county highway map in km ²)	902.2
Stream order	4
Length of stream evaluated (in meters or kilometers)	1 km
Number of lateral transects made	5
Average stream width (in meters)	22.1
Average stream depth (in meters)	1.1
Instantaneous stream flow (in ft ³ /sec)	0.7
Indicate flow measurement method	Doppler
Channel flow status (high, moderate, low, or no flow)	Moderate
Maximum pool width (in meters)	1.2
Maximum pool depth (in meters)	2.7
Total number of stream bends	2
Number of well defined bends	0
Number of moderately defined bends	0
Number of poorly defined bends	2
Total number of riffles	0
Dominant substrate type	Sand
Average percent of substrate gravel sized or larger	0
Average percent instream cover	0
Number of stream cover types	2
Average percent stream bank erosion potential	11.5
Average stream bank slope (in degrees)	84
Average width of natural buffer vegetation (in meters)	4.9
Average riparian vegetation percent composition by: (total to equal 100%)	
Trees	34
Shrubs	12
Grasses and Forbes	45
Cultivated fields	0
Other	9
Average percent tree canopy coverage	73
Overall aesthetic appraisal of the stream	Natural

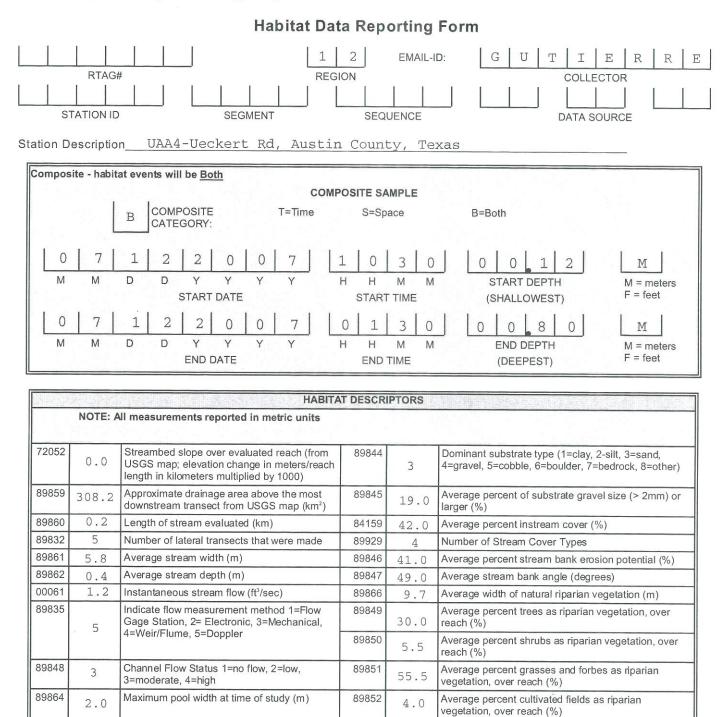
Habitat Assessment Worksheet B Part III of III UAA2

Habitat Parameter		Scoring Ca	tegory	
Available Instream Cover	Abundant >50% of substrate favorable for colonization and fish cover; good mix of several stable (not new fall or transient) cover types such as snags, cobble, undercut banks, macrophytes	Common 30-50% of substrate supports stable habitat; adequate habitat for maintenance of populations; may be limited in the number of different habitat types	Rare 10-29.9% of substrate supports stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed	Absent <10% of substrate supports stable habitat; lack of habitat is obvious; substrate unstable or lacking
Score 1	4	3	2	1
Bottom Substrate Stability	Stable >50% gravel or larger substrate; gravel, cobble, boulders; dominant substrate type is gravel or larger	Moderately Stable 30-50% gravel or larger substrate; dominant substrate type is mix of gravel with some finer sediments	Moderately Unstable 10-29.9% gravel or larger substrate; dominant substrate type is finer than gravel, but may still be a mix of sizes	Unstable <10% gravel or larger substrate; substrate is uniform sand, silt, clay or bedrock
Score 1	4	3	2	1
Number of Riffles To be counted, riffles must extend >50% the width of the channel and be at least as long as the channel width	Abundant ≥ 5 riffles	Common 2-4 riffles	Rare 1 riffle	Absent No riffles
Score1	4	3	2	1
Dimensions of Largest Pool	Large Pool covers more than 50% of the channel width; maximum depth is >1 meter	Moderate Pool covers approximately 50% or slightly less of the channel width; maximum depth is 0.5-1 meter	Small Pool covers approximately 25% of the channel width; maximum depth is <0.5 meter	Absent No existing pools; only shallow auxiliary pockets
Score2	4	3	2	1
Channel Flow Status	High Water reaches the base of both lower banks; < 5% of channel substrate is exposed	Moderate Water fills >75% of the channel; or <25% of channel substrate is exposed	Low Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed	No Flow Very little water in the channel and mostly present in standing pools; or stream is dry
Score2	3	2	1	0

Part III - Habitat Quality Index

UAA2 Part III - Habitat Quality Index (continued)

Habitat Parameter		Scoring Ca	tegory	
Bank Stability (Note: Although slope average was 84%, the type of soils on the banks are not conducive to erosion, so parameter was ranked as 2 instead of 1)	Stable Little evidence (<10%) of erosion or bank failure; bank angles average <30	Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average 30-39.9□	Moderately Unstable Evidence of erosion or bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60□	Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60□
Score 2	3	2	1	0
Channel Sinuosity	High ≥ 2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) present	Moderate 1 well-defined bend <u>or</u> ≥ 3 moderately- defined bends present	Low <3 moderately- defined bends <u>or</u> only poorly-defined bends present	None Straight channel; may be channelized
Score 0	3	2	1	0
Riparian Buffer Vegetation	Extensive Width of natural buffer is >20 meters	Wide Width of natural buffer is 10.1-20 meters	Moderate Width of natural buffer is 5-10 meters	Narrow Width of natural buffer is <5 meters
Score1	3	2	1	0
Aesthetics of Reach	Wilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptional	Natural Area Trees and/or native vegetation are common; some development evident (from fields, pastures, dwellings); water clarity may be slightly turbid	Common Setting Not offensive; area is developed, but uncluttered such as in an urban park; water clarity may be turbid or discolored	Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbid or discolored
Score2	3	2	1	0
Total Score12HABITAT QUALITY IN $26 - 31$ Exceptional $20 - 25$ High $14 - 19$ Intermediate ≤ 13 Limited	DEX		-	



89853

89854

89867

84161

89961

89962

5.0

71.8

2

2

1

2

reach (%)

4=offensive)

Stream Order

3=moderate, 4=high)

1.1

6

2

3

1

6

Maximum pool depth in study area (m)

Number of well defined stream bends

Number of poorly defined stream bends

Number of moderately defined stream bends

Total number of stream bends

Total number of riffles

89865

89839

89840

89841

89842

89843

Average percent other as riparian vegetation, over

Aesthetics (1=wilderness, 2=natural, 3=common,

Land Development Impact (1=unimpacted, 2=low,

Average percent tree canopy coverage (%)

Ecoregion (Texas Ecoregion Code)

Habitat Assessment Worksheet B Part I of III

Worksheet #UAA4		Part I - S	Strear	n Physica	l Chara	cteristics Worl	rsheet	Page 1 of <u>3</u>
Observers: Floyd, Gutierrez, Hard	din			Date: 7/1	2/2007	Time: 10:30 ar	n	
Weather conditions: Sunny and h	not							
Stream: East fork Mill Creek				Stream s	egment	no. UAA4		
Location of site: Ueckert Rd					Length	of reach:	160m	
Observed stream uses:		One old trot li	ne					
Stream type (circle one): peren	nial	or		intermitt	ent w/ p	perennial pools	3	
Stream bends: 6	No. defir		2	No. mode defined	erately	3	No. poorly defined	1
Aesthetics (circle one):		(1) wildernes	S	<u>(2) natur</u>	al	(3) common	(4) offensive	
Channel obstructions or modifica	tions: 1 o	bstruction (dov	wned	tree)		No. of riffles	6	
Channel flow status (circle one):		h	igh	mode	rate	low	no flow	
Riparian vegetation (%):		Left Bank	Righ	nt Bank			Notes	
Trees		35		25	1			
Shrubs		5		6	Larges	st pool – 3.6 ft c	leep/6.5 ft wide	
Grasses or forbs		48		63				
Cultivated fields		8		0		e observed - /hairy woodpeck	er (aural)	
Other		4		6		ow (aural)		
Site map:					cardina frog (vi	al (visual)	-	

Worksheet #UAA4			Part I - S	Stream Physical Characteristics Worksheet (continued)	hysica	al Chai	acteris	stics M	orkshe	set (cor	ntinue	(p				Page _2 of _3	~	
Location of transect	Stream width (m)	Left bank slope (E)	Left bank erosion potential (%)			St	eam Dep	hs (m) (f Thalv Fl	 m) (ft) at Points Thalweg Depth: Flow (ft/s) 	Stream Depths (m) (ft) at Points Across Transect Thalweg Depth: Flow (ft/s)	ransect				Right bank slope (E)	Right bank erosion potential (%)	Tree canopy (%) 67.6	nopy 5
UAA4	4.3m	60	50	0.6 0.43	0.8 0.53	1.1 0.6	1.3 0.52	2.0 0.56	2.5 0.52	2.6 0.47	2.6 0.50	2.6 0.46	2.4 0.29	2.1 0.11	30	70	Total	46
TI	Habitat type (circle one) Riffle <u>Run</u> Glide <u>Pool</u>	circle one) <u>m</u> ol	Dominant substrate type Sand	rate type			Dominar Left bank	Dominant types riparian ve Left bank: Indian sea-oats, e	Dominant types riparian vegetation: Left bank: Indian sea-oats, elm	etation: Im	•	•				% Gravel or larger 40	C C	
							INIGILI Udi		sca-vals									
Macrophytes (circle one) Abundant Common	Algae (sucle one)	ine)	Width of natural buffer vegetation (m)	l buffer veg	cetation (n		Instream cover types:	ar types:								% Instream	LB	Ξ
	Rare	Absent	LB: 60ft	RB: 50ft		roots	s									cover , 25	RB	13
Location of transect	Stream width (m)	Left bank slope (E)	Left bank erosion potential (%)			Str	cam Dept	hs (m) (fi Thalv Flo	H) (ft) at Points Thalweg depth: Flow (ft/s)	Stream Depths (m) (ft) at Points Across Transect Thalweg depth: Flow (ft/s)	ransect				Right bank slope (E)	Right bank erosion potential (%)	Tree canopy (%) 85.3	nopy 3
Τ2	6.3m	25	35	1.0 0.46	1.3 0.64	1.0 1.08	0.8 1.01	0.8 0.94	0.7 1.12	0.7	0.5 0.05	0.5 0.68	0.3 1.07	0.5 0.68	65	50	Total	58
	Habitat type (Circle One) <u>Riffle</u> Run	Circle One) Run	Dominant substrate type	rate type			Dominan Left bank	t types rij : Indian s	Dominant types riparian vegetation: Left bank: Indian sea-oats, sugarberry	etation: 1garberry						% Gravel or larger	CL	14
	Glide	Pool	Dubc				Right bar	ık: Indian	sea-oats,	Right bank: Indian sea-oats, sugarberry						20	CR	15
Macrophytes (circle one) Abundant Common	Algae (circle one) Abundant	tite) Common	Width of natural buffer vegetation (m)	l buffer veg	etation (n		Instream cover types:	r types:								% Instream	LB	14
	Rare	Absent	LB: >20m	RB: 40ft		MOC	woody debris, gravel	gravel								75	RB	15
Location of Transect	Stream width (m)	Left bank slope (E)	Left bank erosion potential (%)			Str	eam Dept	hs (m) (ft Thalv	H) (ft) at Points Thalweg depth:	Stream Depths (m) (ft) at Points Across Transect Thalweg depth:	ransect				Right bank slope (E)	Right bank erosion potential (%)	Tree canopy (%) 76.5	Ydot
Т3	6.2m	70	50	0.4 1.44	0.6 1.52	0.5 1.47	1.0 0.68	1.0 0.20		2.0 0.27 (1.9 0.46	1.8 0.53	1.7 0.67	1.3 0.26	25	35	Total	52
	Habitat type (circle one) <u>Riffle</u> Run	ircle one) Run	Dominant substrate type	rate type			Dominan Left bank	types rip	Dominant types riparian vegetation: Left bank: palmetto, sugarberry	station: Ty						% Gravel or larger	CL	13
	Glide	Pool	Sand				Right bar	k: Indian	sea-oats,	Right bank: Indian sea-oats, 2 large sycamores, 2 large ashes	amores, 2	large asl	les			20	CR	14
Macrophytes (circle one) Abundant Common	Algae (sircle one) Abundant C	ne) Common	Width of natural buffer vegetation (m)	l buffer veg	etation (n		Instream cover types:	r types:								% Instream	LB	13
Rare Abseut	Rare	Absout	LB: >20m	RB: 45ft		1 lai	1 large log, woody debris	ody debr	is							75	RB	12
TCEQ 20156-A (Rev. 4-14-2005)	-2005)																	1

Worksheet #UAA4			Part I - S	Stream Physical Characteristics Worksheet (continued)	nysical	Charac	teristic	s Works	heet (co	ntinue	(p				Page	3 of 3	
Location of transect	Stream width (m)	Left bank slope (E)	Left bank erosion potential (%)			Stream	1 Depths (#	Stream Depths (#) (ft) at Points Across Transect Thalweg Depth: Flow (ft/s)	nts Across oth:	Transect			E E E E E E E E E E E E E E E E E E E	Right bank slope (E)	Right bank erosion potential (%)	Tree canopy (%) 58.8	nopy (8
UAA4	6.5m	45	20	0.9 0.47	0.7 0.63 0	1.4 1.00.33 0.	1.6 1.4 0.59 0.62	1.3	1.3 0.43	1.4 0.36	1.0 0.12	1.4 0.05 0	0.5 0.09	65	40	Total	40
T4	Habitat type (circle one) Riffle Run	circle one) Run	Dominant substrate type	rate type		Do	minant type it bank: Ind	Dominant types riparian vegetation: Left bank: Indian sea-oats	egetation:						% Gravel or larger	CL	∞
	Glide	Pool	Sand			Rig	cht bank: In	Right bank: Indian sea-oats, sugarberry	s, sugarben	Ż					10	CR	∞
Macrophytes (circle one)	Algae (circle one)	one)	Width of natural buffer vegetation (m)	buffer vege	tation (m)	Instream	Instream cover types:								% Instream	LB	13
′	Rare	Abseut	LB: >20m	RB: 20ft		roots, limbs	sdi								cover 20	RB	Ξ
Location of	Stream width	Left bank	Left bank erosion			Stream	Depths (#	Stream Depths (#) (ft) at Points Across Transect	nts Across	Transect				Right bank	Right bank erosion	Tree canopy (%)	nopy
II GIIJOCI	(III)	(E)	potennan (%)				Ľ	Thalweg depth: Flow (ft/s)	th:				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	slope (E)	potential (%)	70.6	,ç
T5	5.7m	65	40	0.5 0.68	0.8 (0.34 0	0.73 0.0	0.5 0.8 0.64 0.36	1.1 0.52	1.5 0.80	1.7 1.13	1.7 0.99	1.2 (0.26 0	0.7 0.08	40	20	Total	48
	Habitat type (Circle One) Riffle Run	Circle One) Run	Dominant substrate type	ate type		Do	minant type t bank: Indi	Dominant types riparian vegetation: Left bank: Indian sea-oats. ash	egetation: ash						% Gravel or laroer	CL	14
	Glide	Pool	Dänd			Rig	ht bank Ind	Right bank Indian sea-oats							Ş	CR	10
Macrophytes (circle one) Abundant Common	Algac (circle one) Abundant C	one) Common	Width of natural buffer vegetation (m)	buffer vege	ation (m)	Instream	Instream cover types:							0.0	% Instream	LB	12
	Rare	Abseut	LB: >20m	RB: 5ft		limbs, roots	ots								15	RB	12
Location of transect	Stream width (m)	Left bank slope (E)	Left bank erosion potential (%)			Stream	i Depths (#	Stream Depths (m) (ft) at Points Across Transect Thalweg depth: Flow (ft/s)	nts Across ⁷ th:	Iransect				Right bank slope (E)	Right bank erosion potential (%)	Tree canopy (%)	yqon
																Total	
	Habitat type (circle one) Riffle Run	circle one) Run	Dominant substrate type	ate type		Doi Lef	Dominant type Left bank:	Dominant types riparian vegetation: Left bank:	getation:						% Gravel or larger	CL	
	Glide	Pool				Rig	Right bank:								2	CR	
Macrophytes (circle one) Abundant Common	Algae (eircle one) Abundant	ine) Common	Width of natural buffer vegetation (m)	buffer veget	ation (m)	Instream	Instream cover types:								% Instream	LB	
Rare Absent	Rare	Absent	LB:	RB:										,	cover	RB	
TCEQ 20156-A (Rev. 4-14-2005)	-2005)]

TCEQ 20156-A (Rev. 4-14-2005)

Habitat Assessment Worksheet B Part II of III

Stream Name East fork Mill Creek (UAA4)	Date 7/17/2007
Physical Characteristics	Value
Stream bed slope over evaluated reach (from USGS map; elevation change in meters/reach length in meters)	0
Approximate drainage area above the transect furthest downstream (from USGS or county highway map in km ²)	308.2
Stream order	2
Length of stream evaluated (in meters or kilometers)	160m
Number of lateral transects made	5
Average stream width (in meters)	5.8
Average stream depth (in meters)	0.37
Instantaneous stream flow (in ft ³ /sec)	1.2
Indicate flow measurement method	Doppler
Channel flow status (high, moderate, low, or no flow)	Moderate
Maximum pool width (in meters)	2.0
Maximum pool depth (in meters)	1.1
Total number of stream bends	6
Number of well defined bends	2
Number of moderately defined bends	3
Number of poorly defined bends	1
Total number of riffles	6
Dominant substrate type	Sand
Average percent of substrate gravel sized or larger	19
Average percent instream cover	42
Number of stream cover types	4
Average percent stream bank erosion potential	41
Average stream bank slope (in degrees)	49
Average width of natural buffer vegetation (in meters)	9.7
Average riparian vegetation percent composition by: (total to equal 100%)	
Trees	30
Shrubs	5
Grasses and Forbes	56
Cultivated fields	4
Other	5
Average percent tree canopy coverage	72
Dverall aesthetic appraisal of the stream EQ-20156-B (Rev. 04-15-2004)	Natural

Habitat Assessment Worksheet B Part III of III UAA4

Habitat Parameter		Scoring Ca	tegory	
Available Instream Cover	Abundant >50% of substrate favorable for colonization and fish cover; good mix of several stable (not new fall or transient) cover types such as snags, cobble, undercut banks, macrophytes	Common 30-50% of substrate supports stable habitat; adequate habitat for maintenance of populations; may be limited in the number of different habitat types	Rare 10-29.9% of substrate supports stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed	Absent <10% of substrate supports stable habitat; lack of habitat is obvious; substrate unstable or lacking
Score <u>3</u>	4	3	2	1
Bottom Substrate Stability	Stable >50% gravel or larger substrate; gravel, cobble, boulders; dominant substrate type is gravel or larger	Moderately Stable 30-50% gravel or larger substrate; dominant substrate type is mix of gravel with some finer sediments	Moderately Unstable 10-29.9% gravel or larger substrate; dominant substrate type is finer than gravel, but may still be a mix of sizes	Unstable <10% gravel or larger substrate; substrate is uniform sand, silt, clay or bedrock
Score2	4	3	2	1
Number of Riffles To be counted, riffles must extend >50% the width of the channel and be at least as long as the channel width	Abundant ≥ 5 riffles	Common 2-4 riffles	Rare 1 riffle	Absent No riffles
Score4	4	3	2	1
Dimensions of Largest Pool	Large Pool covers more than 50% of the channel width; maximum depth is >1 meter	Moderate Pool covers approximately 50% or slightly less of the channel width; maximum depth is 0.5-1 meter	Small Pool covers approximately 25% of the channel width; maximum depth is <0.5 meter	Absent No existing pools; only shallow auxiliary pockets
Score <u>3</u>	4	3	2	1
Channel Flow Status	High Water reaches the base of both lower banks; < 5% of channel substrate is exposed	Moderate Water fills >75% of the channel; or <25% of channel substrate is exposed	Low Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed	No Flow Very little water in the channel and mostly present in standing pools; or stream is dry
Score2	3	2	1	0

Part III - Habitat Quality Index

UAA4
Part III - Habitat Quality Index (continued)

Habitat Parameter		Scoring Ca	tegory	
Bank Stability	Stable Little evidence (<10%) of erosion or bank failure; bank angles average <30□	Moderately Stable Some evidence (10- 29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average 30-39.9□	Moderately Unstable Evidence of erosion or bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60□	Unstable Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60□
Score 1	3	2	1	0
Channel Sinuosity	High ≥ 2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) present	Moderate 1 well-defined bend <u>or</u> ≥ 3 moderately- defined bends present	Low <3 moderately- defined bends <u>or</u> only poorly-defined bends present	None Straight channel; may be channelized
Score <u>3</u>	3	2	1	0
Riparian Buffer Vegetation	Extensive Width of natural buffer is >20 meters	Wide Width of natural buffer is 10.1-20 meters	Moderate Width of natural buffer is 5-10 meters	Narrow Width of natural buffer is <5 meters
Score1	3	2	1	0
Aesthetics of Reach	Wilderness Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptional	Natural Area Trees and/or native vegetation are common; some development evident (from fields, pastures, dwellings); water clarity may be slightly turbid	Common Setting Not offensive; area is developed, but uncluttered such as in an urban park; water clarity may be turbid or discolored	Offensive Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbid or discolored
Score2	3	2	1	0
Total Score21HABITAT QUALITY IN $26 - 31$ Exceptional $20 - 25$ High $14 - 19$ Intermediate ≤ 13 Limited	IDEX			

Appendix G

Water Quality Sampling Forms

	Field Data Sheets 1	or Contact Recrea	tion IIA A
	Data Sheet B	- Site Characterization	n OAA
Stream Segment N	(must be	1 1 1 0 1 1	
Statti Degineni iv	ame West Fork umber NO segment		
Station ID_U4	A-((Station ID requ	lires submittal of SLOG C	
		anes submittal of SLOC ION	n)
Site Location Desc	13/07 14:03		
Personnel (Data Co	llectors): Manager	Westfork mill creek a	" Industry & Bluchole Ral.
Current Weather Co	onditions: for Hy C	Toudy favitra for	" Industry & Blue hole Rel.
Weather Conditions	s for Past 10 days: No Va	aln.	
Is there a WWTP at		/	
If yes, Name of Di	the site? Yes No		
	-	Perm	it #
Drought Conditions	: (Use Palmer Drought Seve	rity Index)	
Extreme Severe	Incipie	nt Dry Spell	Moderately Wet
Moderate	- Near N		Very Wet
Mild	Slightly	nt Wet Spell	Extremely Wet
Site I and in the			
Site Location: X	29.98388 Y	-96.46536	
Latitude Longitude	DINATES (Please Indicate c Datum: NAD 27	oordinate system used for d	ata collection):
State Plane	Datum: NAD 27	OI NAD 83	
UTM	Datum: NAD 27	or NAD 83 Zone or NAD 83 Zone	
Static Mode Dynamic Mode (Kine Precise Positioning Se Signal Averaging	ervice	Topographic N Aerial Photogr Satellite Image	Map or DRG aph or DOQQ
WAAS-Wide	1 Processing	- System	
A A A A A A A A A A A A A A A A A A A	URACI ESTIMATE		
FOM ±	a Quality Meters	Interp	olation Data Quality
EPE ±Feet of	or ± Meters	Source Map Sc	ale: 1:24,000
PDOP			1:100,000 Other
		±Fee	t or \pm Meters
Uses Observed: (Uses	actually observed at time of	site visit)	
Swimming		(10AL)	
Skin diving	Water skiing Wind surfing	Canoeing	Trapping
SCUBA diving	Kayaking	Wading	Fishing
Tubing	Boating	Rafting Hunting	Other
Describe: (Include number of	individuala man di	-	
Recreational Use Interview w	individuals recreating, photo-docur hen conducting interviews.)	nentation of evidence of recreation	al uses, etc. Use Data Sheet D-

or unusual items of inter City/county parks Playgrounds Wildlife Residential	Industrial Urban Campgrounds Boating access	 State parks National forests Nature trails Stairs/walkway 	No trespass sign Fence Steep slopes Other:
Comments: Wire R Slopes are s	Fonde on eit	her side of str	Kam and brodge

Indications of Human Use: (attach photos)

- Roads

- Roads
 RV / ATV Tracks

 Rope swings
 Camping Sites

 Dock/platform
 Fire pit/ring

 Foot paths/prints
 Fishing Tackle
- NPDES Discharge Livestock Watering
- Other

Comments: Only road + raffic.

Photos (attach additional sheets if needed)

Upstream	Photos	Downst	ream Photos	Othe	- DL - (
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose		Photos Photo Purpose
12-1	docamentation	16-1	documentation	17-1	decrementation
			Service and the service service and the service se	18-1	11
				19-1	CI
				20-1	1.1

Stream Morphology

Upstream View's Physical Dimension	s: //	
Is there any water present at this view?	Yes	No
If so, is there an obvious current?	Yes	No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max De d ()
RIFFLE				Median Depin (III)	Max. Depth (m)
RUN	10	110	10		
POOL		4. P	40	0:5	0.75

Downstream View's Physical Dimensions:

	ARCE S
Is there any water present at this view?	Wes
If so, is there an obvious current?	Yes

Wes	No
Yes	No

Select one of the following channel features:

Channel Feature RIFFLE	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RUN	B	Ada	10	10.2	
POOL		4.0	40	0.5	0.75

Substrate (These values should add up to 100%.)

% Cobble	ZO % Gravel	Leo % Sand	% Silt	ZO% Mud/Clay	% Bedrock

Aquatic Vegetation (Note amount of vegetation or algal growth at the assessment site)

Water Characteristics: (Mark all that apply.)

Algae Cover:	absent	_ rare	common	1 abunc	lant do	ominant		
Odor:	none	oil	lacrid	sewage	rotton		musky	
Color:	no color	light	green	dark gree	n 🖾 tan	red gree	enbrown	black
Bottom Deposit:	sludge	solids	fine s	ediments	none	other		. DIGCK
Water Surface:				debris		- M1-CHOUSE		

Comments: (Please attach any additional comments to this form).

Please verify that you have completed all sections, checked all applicable boxes and that everything is complete.

Investigator's Signature:	
investigator's Signature:	Date of Survey: 6/13/07
Organization: 158AJ	Position: S. Snewtoot

Field Data Sheets for Contact Recreation UAA Data Sheet C - Water Quality Data and Depth Measurements

Stream Name_Mil

reek Segment # No segment 1944

Station ID UAA 1

Water quality data only needs to be collected at the stream access point.

Stream Width at Access Point	0.61 meters 23.5' (12')
Total length of reach assessed	12:2 mar Slor per comm w/ JRB
Field Parameters	Parameters Collected for Lab Analysis

Air Temp Water Temp DO pH Conductivity Salinity Secchi Depth Flow severity	27.95 8036/14/c2 27.39 °C 27.39 °C 10.89 mg/l 7.89 0.073 mSkm 0.32 ppt 0.71 m 3
Flow severity Flow (CFS)	3

rs Collected for Lab Analysis (attach lab analyzed data to this form) TSS Ammonia-N □ Nitrate-Nitrogen BOD CBOD Other:

Bacterial Data Collection (attach bacterial results to this form)

Bacteria 🛛 E. Coli	□ Enterococcus □ Other:
Protocol Used	
Timed Average	Total time 60_min at 5_min intervals
\Box Cross section	11 equally spaced samples every m (stream width/12)
Longitudinal	5 equally spaced samples every m (reach length//4)
□ Vertical	Samples collected at surface, mid depth, and bottom

Stream Depth

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

Wadeable Streams – 5	qually spaced transects Starting at lower end or reach and ending at upper end
of reach.	

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
1900	80	5"	8"	6"	3"	4"	2.5"	1.5"						50
		0.127	D.204	0,157	0.0761	D,101	ordet	0.038						
	••													
				9 - N										

Non-wadeable Streams - one transect at access point

Width Bank (m) Slope	1	2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Depth	Bank Slope
-------------------------	---	---	------------	------------	------------	------------	------------	------------	------------	-------------	-------------	-------	---------------

Please verify that you have completed all sections, checked all applicable boxes and that everything is complete.

Signed: Date Organization

____ Position: Sr Sasendist

Field D	ata Sheets for Con	tact Recreation UA	AA
	Data Sheet B - Site C		
	(must be completed	for each site)	
Stream Segment Name Ma	in Fork Tail Cre	ark	
Stream Segment Number			
	_ (Station ID requires subm	intal of SLOC form)	
Date & Time: 6/13/07			
Site Location Description (e.g	., road crossing): Mil	Creek OFM 742	29
Personnel (Data Collectors):	John Brann	- Tecer Mong	
Current Weather Conditions: Weather Conditions for Past 1	LATTY YOURY		
Weather Conditions for Fast I	o days: Not fain		
Is there a WWTP at the site?	Yes No		
If yes, Name of Discharger		Permit #	
Drought Conditions: (Use Pall			
Severe	Incipient Dry Sp Near Normal		erately Wet
Moderate	Incipient Wet Sp	_ Very	emely Wet
Mild	Slightly Wet		mery wet
Site Location: X 29.8	<u>59679</u> <u>y-91</u>	1. 25499	
LOCATION COORDINATES	(Please Indicate coordinate	e system used for data colle	ction):
State Plane D	atum: NAD $27_{}$ or NAD atum: NAD $27_{}$ or NAD	283 V 283 V 7 mm	
Latitude LongitudeDState PlaneDUTMD	atum: NAD 27 or NAD	2005 Zone	
HORIZONTAL COLLECTIO	N METHOD (Indicate the r	method used to determine th	e locational data.)
Global Positioning Sys	tem (GPS)	Interpolation	and in the president of the second statements of the second s
Static Mode		Topographic Map or D	
Dynamic Mode (Kinematic)		Aerial Photograph or D	DOQQ
Precise Positioning Service Signal Averaging		Satellite Imagery	
Real Time Differential Process		Interpolation Other	
WAAS-Wide Area	Augmentation Syc	tem	
HORIZONTAL ACCURACY	ESTIMATE		
GPS Data Qualit		Interpolation	Data Quality
FOM ±Meter		Source Map Scale:	1:24,000
EPE ± Feet or ±	Meters		1:100,000
PDOP			Other
		±Feet or ±	Meters
Uses Observed: (Uses actually	observed at time of site vis	it.)	
C1 1 1 1		Canoeing	Trapping
		- Wading	Fishing
		Rafting	Other
Tubing	Boating	Hunting	
Describe: (Include number of individua	ls recreating, photo-documentation	of evidence of recreational uses	etc. Use Data Sheet D-
Recreational Use Interview when condu	icting interviews.)	Q. Three people	dro walk
bruefly. They le	of here in in	t-evaluate the	tishing conditions
	we co	- U INTERVIEW 44	Erri

Surrounding Conditio	ns: (Mark all that promote or rest.)	or impede recreational uses. Att	ach photos of evidence
City/county parks Playgrounds Wildlife Residential	Industrial Urban Campgrounds Boating access	 State parks National forests Nature trails Stairs/walkway 	 No trespass sign Fence Steep slopes Other:
Comments: Bank	sare steeply	sloped and the making them c	re is concrete langerous.

Indications of Human Use: (attach photos)

Roads Prope swings Dock/platform Foot paths/prints	RV / ATV Tracks Camping Sites Fire pit/ring Fishing Tackle	NPDES Discharge Livestock Watering Other
Comments: Lope Swing bridge there are road where people	pull off marks nex have pulled off	the bridge a the parkel.

Photos (attach additional sheets if needed)

Upstream	Photos	Downst	ream Photos	Othe	er Photos
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
2-1	Accumentition	5-1	documentation	1-1	Locumentation
				2-1	
				6-1	
				7-1	

Stream Morphology

Ups	tream V	liew's Physi	ical Dimens	ions: /	
Is th	ere any	water preser	nt at this view	v? Ves	11
TC		· ·			

is there any water present at this view?	res	INO
If so, is there an obvious current?	Yes	l No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					inax. Deptil (iii)
RUN	Ø	28	250	note	- Aply
POOL		a			Aus

NT.

Downstream View's Physical Dimensions:

	U U		
Is there any wa	ater present at this view?	Yes	No
	in obvious current?	Yes	

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					intaki Deptil (III)
RUN	1	28	750	ash	And
POOL	X		1000	All a	- Orig

Substrate (These va	lues should add	l up to 100%.)			
% Cobble	% Gravel	75 % Sand	% Silt	75% Mud/Clay	% Bedrock

Aquatic Vegetation (Note amount of vegetation or algal growth at the assessment site)

Water Characteristics: (Mark all that apply.)

Algae Cover:	absent	rare	commo	on abund	lant do	ominant		
Odor:	none	oil	lacrid	sewage	rotton	egg	fishy _musky	
Color:	💷 no color	🗉 light	green	dark gree	n 🔡 tan	red	green/brown	black
Bottom Deposit:	_ sludge	solids	fine	sediments	none	other		· Oracit
Water Surface:	clear	scum	foam	debris	sheen			

Comments: (Please attach any additional comments to this form). Log Jamb in front of bridge

Please verify that you have completed all sections, checked all applicable boxes and that everything is complete. Λ .

Investigator's Signature: ALAS Date of Survey: 10/13/01			
	vestigator's Signature:	Date of Survey: 10/13/87	
Organization: Position: So Severalist			

Field Data Sheets for Contact Recreation UAA Data Sheet C - Water Quality Data and Depth Measurements

Stream Name Mill Creek Segment # 12021C Station ID UAAZ

Water quality data only needs to be collected at the stream access point.

 Stream Width at Access Point Total length of reach assessed 28.38 15.2	_meters _meters (stream width x 40) 150 m minimum - 500 m maximum Ma 9/27/07 pic comm w/ JRB
Field Parameters	Parameters Collected for Lab Analysis
Air Temp $30.12 \circ C$ Water Temp $\overline{29.54} \circ C$ DO $7.7\overline{2}$ mg/lpH $\overline{2.86}$ Conductivity 0.15 pptSalinity 0.15 pptSecchi Depth 0.46 Flow severity $\overline{2}$ Flow (CFS) $\overline{22.3}$	(attach lab analyzed data to this form) ■ TSS/V49 ■ Ammonia-N □ Nitrate-Nitrogen □ BOD □ CBOD ■ Other: TP-TVN
Protocol Used □ Timed Average Total time 60 m □ Cross section 11 equally spaced □ Longitudinal 5 equally spaced	results to this form) Other: in atmin intervals samples everym (stream width/12) samples everym (reach length//4) at surface, mid depth, and bottom

Stream Depth

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

Wadeable Streams – 5 equally spo	ed transects Starting at lower end or reach and ending at upper end
of reach.	and any a tower ond or reach and enang at upper end

Stream Width (m)	Left Bank Slope	Point 1	2	3	Point 4	5	Point 6	7	Point 8	9	10	Point 11	Deptit	Right Bank Slope
28.38	80	0.76	0.84	0.61	0.23	0.46	0.76	0.76	0.30	0.30	0.24	0.23	0.76	80

Non-wadeable Streams - one transect at access point

Stream Width (m)	Left Bank Slope		Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
------------------------	-----------------------	--	---------	---------	------------	------------	------------	------------	------------	------------	-------------	-------------	------------------	------------------------

Please verify that you have completed all sections, checked all applicable boxes and that everything is complete.

0-6/13/07 Signed: Date: ____Position: Sr Scientist Organization

Fi	Data Sheet B -	r Contact Recreation Site Characterization mpleted for each site)	
Stream Segment Name Stream Segment Numb Station ID <u>UAR</u>	er NO segment	$\frac{111}{10} (\frac{100}{100} \text{ k})$ = TD # es submittal of SLOC form)	
Date & Time: <u>b/13</u> Site Location Descript Personnel (Data Collec Current Weather Cond Weather Conditions fo	on (e.g., road crossing): E tors): <u>Levita Ramma</u> itions: <u>Lartly Crou</u> r Past 10 days: <u>No ra</u>	of fort mill Creek a shan, marise Web. dy	Upkert Rd. West
	e site?YesNo arger	Permit	#
Drought Conditions: (U Extreme Severe Moderate Mild	Near Nor	Dry Spell rmal Wet Spell	Moderately Wet Very Wet Extremely Wet
LOCATION COORDI	Datum: NAD 27	or NAD 83 or NAD 83Zone_	
Global Position Static Mode Dynamic Mode (Kinem Precise Positioning Serv Signal Averaging Real Time Differential WAAS- Wirde Ac	atic) Processing ea Augmentation S.		Dation Iap or DRG aph or DOQQ
HORIZONTAL ACCU GPS Data FOM ± EPE ±Feet or PDOP	Quality Meters ±Meters	Source Map Sca	Delation Data Quality ale: 1:24,000 1:100,000
Uses Observed: (Uses a	ctually observed at time of	site visit.)	
Swimming Skin diving SCUBA diving Tubing	Water skiing Wind surfing Kayaking Boating	Canoeing Wading Rafting Hunting	Fishing Other
Describe: (Include number of i Recreational Use Interview wh	ndividuals recreating, photo-docu en conducting interviews.)	mentation of evidence of recreation	nal uses, etc. Use Data Sheet D-

Surrounding Condition or unusual items of inter	ns: (Mark all that promote o est.)	r impede recreational uses. At	ttach photos of evidence
City/county parks Playgrounds Wildlife Residential	 Industrial Urban Campgrounds Boating access 	 State parks National forests Nature trails Stairs/walkway 	 No trespass sign Fence Steep slopes Other:
Comments: Ferca	g d gavd rails in	-pede access to	stream.

Indications of Human Use: (attach photos)

Roads Rope swings Dock/platform Foot paths/prints	RV / ATV Tracks Camping Sites Fire pit/ring Fishing Tackle	Livestock Watering Other
Comments:None		

Photos (attach additional sheets if needed)

Upstream	Photos	Downst	ream Photos	Othe	er Photos
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
097	decimentation	24-1	documentation	25-1	2 Ocumentation
				26-1	21
				27-1	N
-				28-1	1

Stream Morphology

Upstream View's Physical Dimension	s: /	
Is there any water present at this view?	Yes	No
If so, is there an obvious current?	Yes	No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	Ø	4.6	20		
POOL					

Downstream View's Physical Dimensions:/

Is there any water present at this view?	Yes	No
If so, is there an obvious current?	Yes	No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE	000				
RUN	Ø	46	AD	- 100	5
POOL			1		

	e values should add	up to 10070.)			
% Cobble	% Gravel	TOO % Sand	70% Silt	ZO% Mud/Clay	% Bedrock
	Q V	70 Guild	70 5111	/o ividu/ ciay	70 Beulock

Aquatic Vegetation (Note amount of vegetation or algal growth at the assessment site)

Water	Characteristics:	(Mark all	that apply)	
TTHEFT	Character istics.	(TATALE all	mai appry.	

Algae Cover:	absent	rare	common	abund	dant do	ominant		
Odor:	none	oil	lacrid	sewage	rotton	egg	fishy _musky	
Color:	l no color	light	green	dark gree	n 🔡 tan	red	green/brown	black
Bottom Deposit:	sludge	solids	fine s	ediments	none	other		
Water Surface:	elear	scum	foam	. debris	sheen			

Comments: (Please attach any additional comments to this form).

Please verify that you have completed all sections, checked all applicable boxes and that everything is complete.

Investigator's Signature:	Date of Survey: 6/13/07
Organization: 15545	Position: Scientist

Field Data Sheets for Contact Recreation UAA Data Sheet C - Water Quality Data and Depth Measurements

Stream Name

Segment # No segment 10th Station ID UAA 4

Water quality data only needs to be collected at the stream access point.

Stream Width at Access Point	O.UI meters 2447 ARB
Total length of reach assessed	3105 meters (stream width x 40) 150 m minimum - 500 m maximum

Field Parameters

Parameters Collected for Lab Analysis (attach lab analyzed data to this form) BTSS/V99 🛛 Ammonia-N □ Nitrate-Nitrogen BOD CBOD Other: TP - TKN

Bacterial Data Collection (attach bacterial results to this form) Bacteria \square *E. Coli* \square Enterococcus \square Other: Protocol Used Total time (00 min at <u>5</u> min intervals Timed Average 11 equally spaced samples every _____ m (stream width/12) □ Cross section

Longitudinal □ Vertical

5 equally spaced samples every _____ m (reach length//4) Samples collected at surface, mid depth, and bottom

Stream Depth

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

Wadeable Streams - 5 equally spaced transects Starting at lower end or reach and e	ending at upper end
of reach.	· · · ·

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
0.61	50	10	17"	20"			21 "	14"					22"	65
		0,254	0,432	0.508	0.559	0.533	0.533	0.356						
														-

Non-wadeable Streams - one transect at access point

	Stream Width (m)		1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
--	------------------------	--	---	------------	------------	------------	------------	------------	------------	------------	------------	-------------	-------------	------------------	------------------------

Please verify that you have completed all sections, checked all applicable boxes and that everything is complete .

compicie.			
Signed: Date: Allow of 4107			
Decit		80	and the
Organization: TPS9	_ Position: _	21-	Scientis

Mg

		Contact Recrea		
	Data Sheet B - Si	te Characterizat	ion	2.
	, (must be comp	leted for each site)		
Stream Segment Name		l Greek		
Stream Segment Numb		Us segment IV	> ·#	
Station ID NAA-	(Station ID requires	submittal of SLOC fo	rm)	
Date & Time: 6/22/	(2(in21))			
Date & Time: 0221	07(1236)	last Fork Mint	1 at ladid. Do 10	In the P
Site Location Description	on (e.g., road crossing):	lear Tome mus coe	ik at Industry Rd/B 1 Jean Maya, Jean	melloe la
Personnel (Data Collect	ors): Partoa Rann	ohan, Rofe Jan	1 dear Maya, Jesen	y massha
Current Weather Condi	tions: Cloudy, 2		F)	
Weather Conditions for	Past 10 days: we	t, earry		
Is there a WWTP at the	site? 🗆 Yes 🗆 No			
If yes, Name of Discha		Pe	rmit #	
, ,			//	
Drought Conditions: (L	se Palmer Drought Severity	Index)		
Extreme	🗆 Incipient D		□ Moderately Wet	
□ Severe	🗆 Near Norm		🗆 Very Wet	
□ Moderate	🗆 Incipient V	Vet Spell	□ Extremely Wet	
🗆 Mild	Slightly W	et		
Cita Lagation V 🖻	9.98388 Y-	GI. MAE	3)	
Site Location: X 2	MATES (Please Indicate coor	dinate sustanting of f	ver data aplication):	
	Datum: NAD 27 or		n data conection):	
State Plane	Datum: NAD 27 or		one	
UTM	Datum: NAD 27 or		one	
HORIZONTAL COLL	ECTION METHOD (Indicat	e the method used to	determine the locational data.)	
	ing System (GPS)		erpolation	
Static Mode		Topograph	ic Map or DRG	/
Dynamic Mode (Kinem	atic)	Aerial Pho	tograph or DOQQ 🛛 📝	
Precise Positioning Service	vice	Satellite In		
Signal Averaging		Interpolati	on Other	
Real Time Differential	Processing	e 1		
WAAS - Wide Ad	Toga Angiventation &	yster		
HORIZONTAL ACCU	Concerning the concerning of the analysis of the stability of the stabilit	_		
GPS Data			terpolation Data Quality	
FOM ±		Source Ma	p Scale: 1:24,000	
EPE ±Feet of	r ±Meters		1:100,000	_
PDOP	_	±	Feet or \pm / Other Meters	
		±		
Uses Observed: (Uses	actually observed at time of s	site visit.)		
Swimming	□ Water skiing	□ Canoeing	□ Trapping	
Skin diving	\Box Wind surfing	□ Wading	□ Fishing	
SCUBA diving	Kayaking	Rafting	□ Other	
Tubing	□ Boating	Hunting	INone	
			and a subscription of the	
Describe: (Include number of Recreational Use Interview w	individuals recreating, photo-docum	nentation of evidence of re	creational uses, etc. Use Data Sheet D	-
teersutional ose interview w	nen conducting interviews.)			

gee poten gee tota greets from Ever t

□City/county parks	Industrial	State parks	🗆 N	o trespass sign
Playgrounds	🗆 Urban	National for	ests 🗌 F	ence
🗌 Wildlife	□ Campgrounds	□ Nature trails		teep slopes
Residential	□ Boating access	□ Stairs/walkv	vay 🗄 O	ther:
Comments:	buggerdd ic.s	9622/07		
Indications of Human	Use: (attach photos)			
Roads	🗆 RV / AT	W Tracks	□ NPDES Di	scharge
Rope swings	□ Camping		Livestock V	
Dock/platform	\Box Fire pit/			
☐ Foot paths/prints	□ Fishing			
Comments:				
Photos (attach addition	al sheets if needed)			
Unstream Photos	Downstr	ream Photos Photo Purpose Streamman & left Gaule	Other Phot Photo ID# Photo	
Photos (attach addition Upstream Photos Photo ID# Photo Purpose CO6443 facuy disv	Sbeammen Photo ID# Ssco6437	Photo Purpose Strammin & left		
Upstream Photos Photo ID# Photo Purpose 206443 Jarry dov	Sbeammen Photo ID# Ssco6437	Photo Purpose Strammink left		
Upstream Photos Photo ID# Photo Purpose CO6443 facuy dov facuy dov Stream Morphology Upstream View's Phy Is there any water prese	sical Dimensions:	Photo Purpose Streamman left Gaule		
Upstream Photos Photo ID# Photo Purpose CO6443 facuy disv facuy	sical Dimensions: ent at this view?	Photo Purpose Steamman left Gaule		
Upstream Photos Photo ID# Photo Purpose CO6443 facuy disv Stream Morphology Upstream View's Phy Is there any water prese If so, is there an obviou Select one of the follow Channel Feature Dista	sbeammen Photo ID# Asstean Asco 437 sical Dimensions: ent at this view? Yes is current? Yes	Photo Purpose Steamman left Gaule		
Upstream Photos Photo ID# Photo Purpose CO6443 facuy disv Stream Morphology Upstream View's Phy Is there any water prese If so, is there an obviou Select one of the follow Channel Feature Dista RIFFLE	sical Dimensions: sical Dimensions: ent at this view? sis current? wing channel features: nce from access (m) Width	Mo Length (m)	Photo ID# Photo	Purpose
Upstream Photos Photo ID# Photo Rurpose CO6443 facuy disv Stream Morphology Upstream View's Phy Is there any water prese If so, is there an obviou Select one of the follow Channel Feature Dista RIFFLE	sical Dimensions: ent at this view?	Mo Length (m)	Photo ID# Photo	Purpose

Is there any water present at this view? \Box Yes \Box No If so, is there an obvious current?

Yes 🗆 No

Select one of the following channel features:

1	Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
	RIFFLE					
0		dewasteram of bridge	4.6	40	~~~~~	
	POOL	v v	1			

Substrate (These va	lues should add	l up to 100%.)					
% Cobble 7	🥟 % Gravel	🔊 % Sand	% Silt	20 % Mud/Clay	% Bedrock		
Aquatic Vegetation (Note amount of vegetation or algal growth at the assessment site)							
Water Characteristics: (Mark all that apply.) Algae Cover: absent rare common abundant dominant Odor: Inone oil acrid sewage rotton egg fishy musky Color: Ino color light green dark green tan red green/brown black Bottom Deposit: sludge solids fine sediments none other ught brown/ yetter Water Surface: clear scum foam debris sheen							
Comments: (Please attach any additional comments to this form).							
Please verify that you have completed all sections, checked all applicable boxes and that everything is complete.							
Investigator's Signat Organization:	ure: 🖄 PBSAJ	۵	Date of Su Position:	rvey: 6/22 Engineers I	107		

Field Data Sheets for Contact Recreation UAA Data Sheet C - Water Quality Data and Depth Measurements

NO Segment ID# Stream Name West Fork Mul Greek Station ID UAA-MC-1 Segment # -

Water quality data only needs to be collected at the stream access point.

Stream Width at	Access Point 3.66	meters
Total length of re		meters (stream width x 40) 150 m minimum - 500 m maximum
	12.2	MW \$27/07 per comm w/ JRB
Field Parameter	rs	Parameters Collected for Lab Analysis
	211	(attach lab analyzed data to this form)
Air Temp	31-6 °C	UTSS/VSS
Water Temp	2601 °C	🗄 Ammonia-N
DO	<u>5-99</u> mg/1	□ Nitrate-Nitrogen
pH	7.60	BOD
Conductivity	0.321	
Salinity	0-15 ppt	DOther: TP/ TKN
Secchi Depth	(ft (nespean)	
Flow severity	3-normal	
Flow (CFS)	1019 (calculated)	

Bacterial Data Collection (attach bacterial results to this form)

Datter Data Conte	tion (utation bucterial results to this form)
Bacteria E. Coli	□ Enterococcus □ Other:
Protocol Used	
□ Timed Average	Total time min at min intervals
Cross section	511 equally spaced samples every m (stream width/12)
Longitudinal	5 equally spaced samples every m (reach length//4)
Vertical	Samples collected at surface, mid depth, and bottom
other	5 samples taken at the same time across stream will at access
Stream Depth	pourt.

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

Wadeable Streams - 5 equally spaced transects Starting at lower end or reach and ending at upper end of reach.

Stream Width (m)	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
				/	A	Stal	7						
					0¢	91							

flow velocities & Co. 2 depth 1.00 1.47 0.53 flow velocities & Co. 8 depth 0.99 1.17 0.47 Als Non-wadeable Streams - one transect at access point

Stream													Thalweg	Right
Width	Bank	Point	Depth	Bank										
(m)	Slope	1	2	3	4	5	6	7	8	9	10	11		Slope
3.66	30	1.16	1.33'	1'									1,33	50

Please verify that you have completed all sections, checked all applicable boxes and that everything is complete.

Signed: Date:_	· ·	6/22/07		
Organization:_	PBSRI	5	Position:	Engineer I

		ts for Contact Recreation UA	AA
		et B - Site Characterization t be completed for each site)	
	Stream Segment Name MAin Fork Mu	U Cleek	2
	Stream Segment Number	UDA-CAC-21207K	60 ⁻
	Station ID UAA-Z (Station ID	requires submittal of SLOC form)	
	Date & Time: 06 22/07 (1430)		
	Site Location Description (e.g., road crossi	ma). In 18962 Tron of Mill Ca	eek and FM 2429
	Personnel (Data Collectors): Pawcha	Ranamohan, Kale tam, tea	se Maria Josemy Marshall
	Current Weather Conditions:	londy soft (30°C)	and the state of t
	Weather Conditions for Past 10 days:		
		. · · · · ·	
	Is there a WWTP at the site? If yes, Name of Discharger		
	It yes, Name of Discharger	Permit #	
	Drought Conditions: (Use Palmer Drought	Severity Index)	
	Extreme		lerately Wet
		lear Normal Very	
			emely Wet
		lightly Wet	
(Site Location: X Z9, 89679	y -96.25499	
(LOCATION COORDINATES (Please Ind	icate coordinate system used for data colle	ection):
the	Latitude Longitude Datum: NAD	27 or NAD 83	
dee	State Plane Datum: NAD	27 or NAD 83 Zone	
X X	UTM Datum: NAD	27 or NAD 83 Zone	
See took sheet	HORIZONTAL COLLECTION METHOD) (Indicate the method used to determine the	he locational data)
Yes A G	Global Positioning System (GPS)	Interpolation	le locational data.)
E	Static Mode	Topographic Map or I	DRG
		Aerial Photograph or I	DOQQ
	Precise Positioning Service Signal Averaging	Satellite Imagery	
	Real Time Differential Processing	Interpolation Other	
/	WARS- Wede Area Sugwended	her System	
	HORIZONTAL ACCURACY ESTIMATE		
	GPS Data Quality		n Data Quality
	$FOM \pm \underline{\qquad Meters}$ $EPE \pm \underline{\qquad Feet or \pm \qquad Meters}$	Source Map Scale:	
	PDOP	5	1:100,000 Other
		\pm Feet or \pm	Meters
	Uses Observed: (Uses actually observed at	time of site visit.)	
	Swimming Water skiin	g Canoeing	1 Trapping
	Skin diving Wind surfin		Fishing
	SCUBA diving	Rafting	Other
	1 Tubing Boating	Hunting	BNONE
	Describe: (Include number of individuals recreating, p	hoto-documentation of evidence of recreational uses	etc. Lise Data Sheet D
	Recreational Use Interview when conducting interview		

Surrounding	Conditions : (Mark all the set of interest)	nat promote or	impede recreat	ional uses. Attach ph	lotos of evidence
	the of meerest.			P	is to sol evidence
City/county		al	State par	rks	No trespass sign
_ Playgrounds	_ Urban		1 National		Fence
] Wildlife	Campgr		Nature ti		Steep slopes
🗋 Residential	 Boating 	access	Stairs/w:	14	Other:
Comments:	Steepslopes tri	prop)			
Indications of	f Human Use: (attach pł	notos)			
Roads		RV/ATV TI	roalra		
Rope swing		Camping Site		□ NPDES [Discharge
Dock/platfo		Fire pit/ring	-5	Livestock	Watering
□ Foot paths/p		Fishing Tack	la	□ Other	
Comments: Photos (attach Upstream Photo Photo ID# Photo	D	d) Downstream F	Photos	Other Pho	
DSC06475 Sh	and banks	hoto ID# Photo	Purpose Tocam onn	Photo ID# Photo) Purpose
Is there any wate If so, is there an	s's Physical Dimensions: er present at this view? obvious current?	Yes I No Yes I No			
Channel Easture	following channel featur				
RIFFLE	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RUN					
POOL	\bigcirc	6.096	250		web for the second second second
Downstream Vie Is there any water If so, is there an o		ls: ⊢Yes □ No ⊨Yes □ No			

Select one of the following channel features:

Distance from access (m)	Width (m)	T an at 1		1
		Length (m)	Median Depth (m)	Max. Depth (m)
	0.09L	700		
	Unit y	00		
-	Distance from access (m)	Distance from access (m) Width (m)		

0

Substrate (Thes	e values should add	1 up to 100%.)			
% Cobble	% Gravel	🕬 % Sand	30 % Silt	30 % Mud/Clay	% Bedrock
Aquatic Vegeta	tion (Note amount	of vegetation or a	lgal growth at the	assessment site)	re
Algae Cover: Odor: Color: Bottom Deposit: Water Surface:	I no color I li I sludge I soli Lefear I scurr	e loommon lacrid lse ight green l dar ids fine sedin n foam l	ewage idrotton o rk green id tan nents idnone debris id sheen	egg Ifishy Imusk Ired I green/brown	n 🛛 black
complete.	gnature:			urvey: 06/22/0 Tryiners IL	

Contact Recreation UAA Draft Protocol

		F	ield	Data	Shee	ts for	Con	tact I	Recre	ation	UAA	A			
	Dat	a She	eet C	- Wa	ater (Quali	ty Da	ta an	d De	pth N	leasu	ireme	ents		
Stre	am Nam	ie	Mul	Oree	lc		Segme	ent #	IAA-MA	<u>-1</u>		on ID_	UBA-MC	2	
Wate	er quality			ds to be	collecte	ed at the	e strean	1 access	point.				N		
	am Width l length o			nt d	6.096	mete	rs (¹ /4 rs (strea	f f im widt	<i>њ</i> Бе h x 40)	5te 150 m i	an V minimut	veeth m - 500	m maximun TRB	1	
Field	l Param	eters			6.2	Para	meters	Q7/07 Collect	ed for l	Lab An	alvsis		KB		
Wate DO	Temp er Temp luctivity ity hi Depth severity (CFS)	26	<u>10</u> m	C ng/l		(attac TS An	h lab ar S / VS- monia- rate-Nit	nalyzed S N trogen	data to	this for	m)				
Flow Flow	severity (CFS)	3-4	-7.1 cf	al S (Calu	ilate	e) =1	1. of	total	steer	w wie	eth				
Tin Cru Lo Ve Strea For p facing	and Used med Ave oss section ngitudina trical from Deption urposes of g downst	rage on al - 5 f h of transe ream.	Si ample, ect mea	sureme	nt, left a	at su at a and righ	rface, n bout A	nid dept fe Sou orientati	m (h, and t we tig	etermine	ength//4	2 varts 2 varts 2 varts varde ne inves	tigator upper end		
Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope	
One d	epth/ve	lsut	, me	asule	ment	fak	ier a	t zyp	rt gu	laster	of st	sean	due to o 8 depth= 1.	o mod	lesote.
Non-v Stream	wadeable	e Strean	<i>ns</i> – one	e transe	ct at acc	ess poi	nt ve	loary	at 0-2	depth =	2.09	H/sat			
Width (m)	Bank Slope	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope	
compl	e verify the	1.57f	have co			ctions, c	hecked			_			ing is		
Organ	ization:_		PBSA	٢				_ Positic	on: _ 7	ige.	rely	L			
24															

Field Data Sheets for Contact Recreation UAA

		Data Sheet B - Site Ch									
	Charles Constant N	East Mu Cre									
	Stream Segment Name Stream Segment Number				4						
	Station ID JAA 4	$\frac{uaa}{m} + \frac{m}{n}$ (Station ID requires submit	tal of SLOC form)								
			lai of SLOC Iorin)								
	Date & Time: 6/22/07	2 (1330)			- 01						
	Site Location Description (e.	g., road crossing): Intersect	ion of East Mill	beek and Uecker	Ra						
	Personnel (Data Collectors):	Hav toa Rammohan	Kofe Jam, Jesse	Creek and Ueckert Maza, Jeserry Ma	shall						
	Weather Conditions for Past	10 days: Jainey we	+ (30 C)								
	in caller conditions for rast	To days									
	Is there a WWTP at the site?	I Yes No									
	If yes, Name of Discharger_		Permit #								
	Drought Conditions: (Use Pa	Inton Dugualit Samerity In In)									
	Extreme	Imer Drought Severity Index)	11 Mor	lorotaly Wat							
	Severe	Near Normal		lerately Wet v Wet							
	Moderate	Incipient Wet Spe		emely Wet							
	Mild	Slightly Wet		,							
/	Site Location: X 30.02868 Y-96.40443										
(LOCATION COORDINATE	S (Please Indicate coordinate	evetern used for data call	action).							
	Latitude Longitude	Datum: NAD 27 or NAD 8	83 1	ection):							
		Datum: NAD 27 or NAD	3 Zone								
		Datum: NAD 27 or NAD 8									
cret 1	HODIZONTAL COLLECTION			enter al anno 1							
Event Lets	Global Positioning Sy	ON METHOD (Indicate the m									
2215)	Static Mode	stem (GrS)	Interpolation Topographic Map or I								
A ace	Dynamic Mode (Kinematic)		Aerial Photograph or								
N. Lay	Precise Positioning Service		Satellite Imagery								
Hus	Signal Averaging		Interpolation Other								
	Real Time Differential Process WAAS-Wale Area A	sing									
	HORIZONTAL ACCURACY										
(GPS Data Qual		Interpolation	n Data Quality							
1	FOM ±Met		Source Map Scale:	1:24,000							
	$EPE \pmFeet or \pmFeet$	Meters	•	1:100,000							
	PDOP		-	Other							
			\pm Feet or \pm _	Meters							
	Uses Observed: (Uses actuall	v observed at time of site visit	t.)								
		,									
			Canoeing	Trapping							
			Wading	Fishing							
			Rafting	Other							
	Tuonig	Boating	Hunting	is Nor							
	Describe: (Include number of individu	als recreating, photo-documentation	of evidence of recreational uses	, etc. Use Data Sheet D-							
	Recreational Use Interview when con-										

f interest.)		State parks	. 1	No trespass sign
Urban		State Darks		No fresnass sign
		National fore		Fence
Campgrour	ıds	Nature trails		Steep slopes
Boating acc		Stairs/walkw		Other:
61	zzards,	barb wi	se/fence	-
man Use: (attach phot	:os)			
1.1	RV / ATV Tra	rke	NPDEST	Discharge
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lose Pho	to ID# Photo			
	45 down:	banks	Photo ID# Photo <u>ASC 06457</u> <u>ASC 06458</u> <u>u</u>	to Purpose psbeam yft ba psbeam left ba
Jean View Discol	Kes INO	steam vew	<u>ASC 06457</u> <u>w</u> <u>ASC 06458</u> <u>w</u>	to Purpose psbeam rft bar psbeam left bar
gy Physical Dimensions: present at this view? A vious current?	Yes I No	banks	ASC 06457	pspian yft bar pspian left bar
gy Physical Dimensions: present at this view?	Yes INO	steam vew	Median Depth (m)	pspian yft bar pspian left bar
gy Physical Dimensions: present at this view? A vious current?	Yes I No	banks	ASC 06457	pspian yft bar pspian left bar
.1	man Use: (attach phot	man Use: (attach photos)	man Use: (attach photos)	man Use: (attach photos) I RV / ATV Tracks I Camping Sites I Livestock I Fire pit/ring I Other I Fishing Tackle itional sheets if needed) Downstream Photos Other Ph

Select one of the following channel features:

	Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
	RIFFLE					
0		downotican of broge	4.6	40		
	POOL) 0				

Substrate (These	values should add	d up to 100%.)			
% Cobble	% Gravel	✤ Sand	% Silt	20 % Mud/Clay	% Bedrock
Aquatic Vegetat	ion (Note amount	of vegetation or algal	growth at the	assessment site) _人	Dul
Odor: Color: Bottom Deposit: Water Surface:	A absent I rare I none I oil I no color M h I sludge I sol I clear I scun	that apply.) e dcommon dab dacrid dsewa ight green dark g ids define sediment n d foam deb tional comments to thi	ge llrotton e reen ll tan ts llnone l ris ll sheen	egg []fishy []mu []red []green/broy []other	wn 🗋 black
Please verify that complete. Investigator's Sign Organization:	nature: Ra	ed all sections, check		le boxes and that ever rvey: 6/22/07 Engineers I	

Field Data Sheets for Contact Recreation UAA Data Sheet C - Water Quality Data and Depth Measurements

Segment # UAA me +104 Stream Name East Mul Creek Station ID 11 AA-MC-4 Water quality data only needs to be collected at the stream access point. 4.88 meters Stream Width at Access Point

Total length of	reach assessed	12,2 meters (stream width x 40) 150 m minimum - 500 m maxim	ит
Field Parame	ters	Parameters Collected for Lab Analysis	
Air Temp	31-6 °C	(attach lab analyzed data to this form)	
Water Temp	26.48°C	Ammonia-N	
DO	<u>5°29</u> mg/l	Nitrate-Nitrogen	
pH	7-66	BOD	
Conductivity	0.316	CBOD	
Salinity	015 ppt	Other: TP-TKN	
Secchi Depth	1ft		
Flow severity	3-roomal		
Flow (CFS)	_22.9 (Ca	ulated)	

Bacterial Data Collection (attach bacterial results to this form)

Bacteria NE. Coli	Enterococcus Other:
Protocol Used	
Timed Average	Total time min at min intervals
Cross section	5 H equally spaced samples every m (stream width/12)
Longitudinal	5 equally spaced samples every m (reach length//4)
U Vertical	
9 Other	5 samples collected at the same time, evening spinced with
Stream Depth	stream wedth
F Other Stream Depth	5 samples collected at the same time, evening spined new

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point	Point 5	Point	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
					-	HI.	27							
						19.								
	0.744	L 0.52	1	1.06										

Wadeable Streams - 5 equally spaced transects Starting at lower end or reach and ending at upper end 1

measured velocities: 0.8 depth 0.5 0.8 1-04

Non-wadeable Streams - one transect at access point

Stream Width	Left Bank	Point	Thalweg Depth	Right Bank										
(m)	Slope	1	2	3	4	5	6	7	8	9	10	11		Slope
4.88	50	1.61	2-91	2.2'									2.9'	65

Average velocities 0.5/ft/s 0.4/ft/s Please verify that you have completed all sections, checked all applicable boxes and that everything is complete.

6/22/07 5 Signed: Date: 💡

Organization:

Position:

Expires I

	F	ield Data Sheets for			
			Site Characteriza	tion	
	Stream Segment Nam	. Wfill Creet	5		
	Stream Segment Num		s submittal of SLOC f	orm)	
	Personnel (Data Colle Current Weather Conc	ion (e.g., road crossing): ctors): Payot pro R litions: Coudy pr Past 10 days: Rainford	ammahan	e & Indust hop: Jam, Jus	Et Dyer Stan Dyer Schlitztus
	Is there a WWTP at th If yes, Name of Discl		Pe	ermit #	Marisa Webe John Braman
	 Extreme Severe Moderate Mild 	Use Palmer Drought Severity □ Incipient I □ Near Norr □ Incipient V □ Slightly W 9998786 Y -	Dry Spell nal Wet Spell /et	□ Moderately Wet □ Very Wet □ Extremely Wet	John Brandy Jesse Mayo
ree Event (totata totata totata totata	LOCATION COORDI Latitude Longitude State Plane UTM HORIZONTAL COLL Global Position Static Mode Dynamic Mode (Kinem Precise Positioning Ser Signal Averaging Real Time Differential	NATES (Please Indicate coo Datum: NAD 27 or Datum: NAD 27 or Datum: NAD 27 or ECTION METHOD (Indicat ing System (GPS) hatic) vice	r NAD 83 Z r NAD 83 Z r NAD 83 Z r NAD 83 Z r the method used to a Inter Topograph Aerial Phot Satellite Im Interpolatic	or data collection): one one determine the locational data. erpolation ic Map or DRG tograph or DOQQ)
	FOM ±Feet on PDOP	Quality _Meters	In Source Map		
	Uses Observed: (Uses a	actually observed at time of s		Feet or ±Meters	
	 Swimming Skin diving SCUBA diving Tubing 	 Water skiing Wind surfing Kayaking Boating 	 Canoeing Wading Rafting Hunting 	□ Trapping □ Fishing □ Other	
	Describe: (Include number of Recreational Use Interview wh	ndividuals recreating, photo-docum en conducting interviews.)		eational uses, etc. Use Data Sheet D	

78	Surrounding (or unusual item	Conditions: (Mark all th	at promote or ir	npede recreatio	onal uses. Attach pho	tos of evidence						
	City/county pa Playgrounds Wildlife Residential		ounds	 State park National f Nature tra Stairs/wal 	orests] ils]	No trespass sign Fence Steep slopes Other:						
	Comments:				None							
	Indications of 1											
	 ☑ Roads ☑ Rope swings ☑ Dock/platforn ☑ Foot paths/pr 	n [RV / ATV Train Camping Sites Fire pit/ring Fishing Tackles 	5	NPDES DLivestockOther							
	Comments: New											
	Photos (attach a	dditional sheets if neede	ed)									
DSCO65	UP	Purpose Flore F	menstere	Purpose	Other Photo Photo ID# Photo							
DSCOGSU	12-43 9	showing dow	nertere	mob	radge cros	enton of	transects					
	Stream Morphology DS COGS44 -561 - Bho curring Selection of Upstream View's Physical Dimensions: Is there any water present at this view? Yes INO If so, is there an obvious current? If so, is there an obvious current?											
	Select one of the Channel Feature RIFFLE	following channel featu Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)]					
	RUN POOL	\bigcirc	4.6	40								

Downstream View's Physical Dimensions:

Is there any water present at this view?	🗆 Yes	🗆 No
If so, is there an obvious current?	🗆 Yes	🗆 No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					That Deptil (III)
RUN	0	4-10	40		
POOL					

Substrate (These values should add up to 100%.) % Cobble % Gravel % Silt % Mud/Clay % Bedrock
Aquatic Vegetation (Note amount of vegetation or algal growth at the assessment site)
Water Characteristics: (Mark all that apply.) Algae Cover: absent rare common abundant dominant Odor: Inone Ioil acrid sewage rotton egg fishy musky Color: Ino color Ilight green Idark green Itan red green/brown black Bottom Deposit: Isludge Isolids fine sediments Inone Iother Water Surface: Iclear Iscum Ifoam debris Isheen
Please verify that you have completed all sections, checked all applicable boxes and that everything is complete. Investigator's Signature: $Pail-Rammahar Date of Survey: 06 08 0.7$ Organization: $PBST$ Position: Engineer-11

 $[n_{\rm p}]$

Field Data Sheets for Contact Recreation UAA Data Sheet C - Water Quality Data and Depth Measurements ent ID# Stream Name 1031 Segment # Station ID Water quality data only needs to be collected at the stream access point. 3.96 _meters Stream Width at Access Point Total length of reach assessed meters (stream width x 40) 150 m minimum - 500 m maximum **Field Parameters** Parameters Collected for Lab Analysis 32 20 (attach lab analyzed data to this form) Air Temp °C 3 TS8/159 Water Temp 1.89 °C Ammonia-N DO mg/l □ Nitrate-Nitrogen pH BOD Conductivity CBOD Salinity ppi Other: 7 Secchi Depth Flow severity Flow (CFS) 20 Bacterial Data Collection (attach bacterial results to this form) Bacteria E. Coli □ Enterococcus □ Other: Protocol Used □ Timed Average Total time _____min at _____min intervals \Box Cross section 60 11 equally spaced samples every _____ m (stream width/12) 5 equally spaced samples every _____ m (reach length//4) **N**Longitudinal 247.M □ Vertical San ples collected at surface, mid depth, and bottom **Stream Depth** For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream. Wadeable Streams - 5 equally spaced transects Starting at lower end or reach and ending at upper end

K Lom)
tople 23indeg
0.32 13 velocity

of reach.

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
3.96	65	*	See	rev	erse	Sid	e of	form	1.				0.33	85
]														

Non-wadeable Streams - one transect at access point

Stream Width (m)	Point 1	Point 2	Point 3	Point 4	Point	Point 0 6	Point	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
					Ŭ							and the second se	

Please verify that you have completed all sections, checked all applicable boxes and that everything is complete.

Signed: Date Organization

Position:

160

Contact Recreation UAA Draft Protocol

Flow Transact

Atocavion Rt. Sank 1 RS- JESTOT 2	Depth (m)	Flow (f/s)	
Et. Sank 1	0.18	0.15	
128/07 2	0.15	0.08	
	0.20	51.0	
4	0.23	0.15	
5	0.25	0.15	
6	0.31	Orth	
7	0.33	0.30	
8	0.33	0.49	
9	0.33	0.46	
10	0.33	0.53	
11	0.28	0.41	
12	0.33	0.37	
13	0.33	0.56	
14	0.33	0-56	
15	0.31	0.40	
ių	0.33	0.35	
(17	0.31	0.37	
18	· 2.31	0.79	
19	0.38	0.18 0	
HBank ZO	0.20	0.03	
16			

128/07

	Field	Data Sheets for Cont	act Recreation U	AA					
	Data Sheet B - Site Characterization								
	(must be completed for each site)								
	Stream Segment Name MED Creek - Main Stern								
	Stream Segment Number_	IZOZK							
	Station ID UAA ~ 2 (Station ID requires submittal of SLOC form)								
	Date & Time: 06 29	107, 1036 1							
	Site Location Description (e.g., road crossing): Interection of MC & FM 2429								
	Date & Time: <u>66129161</u> , <u>50129161</u> , <u>5012929</u> Site Location Description (e.g., road crossing): <u>501262000</u> MC & FM 2429 Personnel (Data Collectors): <u>62929</u> Hordon and Jereny Marsh								
	Current Weather Conditions: Partly closely, eq. 31 C								
	Weather Conditions for Past 10 days: Ranny Outplan								
	Is their a WWTP at the site		_						
	If yes, Name of Discharge	er	Permit #						
	Drought Conditions: (Use)	Palmer Drought Severity Index)							
	\Box Extreme	□ Incipient Dry Spe		lerately Wet					
	□ Severe	□ Near Normal							
	□ Moderate	Incipient Wet Specification		emely Wet					
	\Box Mild	Slightly Wet							
	Site Location: Z9, 89	1679	16.25499						
/	LOCATION COORDINAT	TES (Please Indicate coordinate							
(Latitude Longitude	Datum: NAD 27 or NAD	83	2000).					
15	State Plane	Datum: NAD 27 or NAD							
Leer	UTM	Datum: NAD 27 or NAD	83 Zone						
See datasheets	HODIZONTAL COLLEGE								
all de hv	HUKIZUNTAL COLLECT	TION METHOD (Indicate the m		he locational data.)					
J'CONA /	Global Positioning System (GPS) Interpolation Static Mode Topographic Map or DRG								
AN Y Y	Dynamic Mode (Kinematic))	Aerial Photograph or						
Y	Precise Positioning Service		Satellite Imagery						
	Signal Averaging		Interpolation Other						
	Real Time Differential Proc WAAS-Wide Area A	cessing tof							
	HORIZONTAL ACCURAC	-							
	GPS Data Qu	ent were same were de la construction de la	Internolation	n Data Quality					
		eters	Source Map Scale:	1:24,000					
	EPE ±Feet or ±			1:100,000					
	PDOP			Other					
			±Feet or ± _	Meters					
	Licos Obsorvede (Licos este	ally abaamind at time of site site							
	Uses Observeu: (Oses actua	ally observed at time of site visi	t.)						
	□ Swimming	□ Water skiing	Wading	Fishing					
	🗆 Skin diving	e	Rafting	\Box Other					
	□ SCUBA diving	Ū.	Hunting	in a b					
	🗆 Tubing	□ Boating	Trapping	arkou					
	Describes (Include south as of 's 1'								
	Recreational Use Interview when c	iduals recreating, photo-documentation onducting interviews.)	of evidence of recreational uses	, etc. Use Data Sheet D-					
	5								

	Surrounding Conditions: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)										
	 City/county parks Playgrounds . Wildlife Residential 	□ Industrial □ Urban □ Campgrour	□ Industrial		rests	No trespass sign Fence Steep slopes Dther:					
	Comments:				No	ne.					
	Indications of Huma	Indications of Human Use: (attach photos)									
	Roads Rope swings Dock/platform Foot paths/prints 		RV / ATV Tra Camping Sites Fire pit/ring Fishing Tackle		 NPDES Discharge Livestock Watering Other 						
	Comments:	Jone									
	Photos (attach additional sheets if needed)										
Emg_0	Upstream Photos Photo ID# Photo Purpose 9821 822 Show Stream Morphology	h N Pho	m se	Purpose	Other Photo Photo ID# Photo	tos Purpose					
	Select one of the follow Channel Feature Dista			Length (m)	Median Depth (m)	Max. Depth (m)					
C	RIFFLE RUN POOL	0	26	250							
C			s:	250							

If so, is there an obvious current?	🗆 Yes	🗆 No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE			-		
RUN	\mathbb{O}	26	250	~	
POOL					

Substrate (Thes	e values should add	d up to 100%.)							
% Cobble	% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock				
Aquatic Vegetation (Note amount of vegetation or algal growth at the assessment site)									
	ristics: (Mark all t								
	🗋 absent 🛛 rare			ominant					
Odor: .	□none □oil	□acrid □se	wage Drotton	egg 🗆 fishy 🗆 musky					
Color: .	\Box no color \Box li	ight green 🛛 🗆 dar	'k green 🛛 tan	□red 🛛 green/brown	black				
	🗆 sludge 🛛 soli	ids 🛛 fine sedim	ients Inone	Dother					
Water Surface:	\Box clear \Box scum	n 🗆 foam 🗆 d	lebris 🗆 sheen	DR: pples					
Comments: (Plea	se attach any addit	ional comments to	this form)	1.					
•									
Please verify that	you have complete	ed all sections, che	ecked all applicat	ble boxes and that everyth	ing is				
complete					-				
	PI	D d	7	nola la					
Investigator's Sig	nature: 10 V	ralamou	nam Date of S	urvey: 06 P910	1				
Organization:	1-1221	A	Position:	urvey: 06/29/0 Enginee	4				
				0					

Field Data Sheets for Contact Recreation UAA Data Sheet C - Water Quality Data and Depth Measurements Mill CREEK_Segment # 1202/L Stream Name Station ID VAA- 2 Water quality data only needs to be collected at the stream access point. 33 Stream Width at Access Point meters Total length of reach assessed 000 _meters (stream width x 40) 150 m minimum - 500 m maximum NON - WADEABLE **Field Parameters** Parameters Collected for Lab Analysis (attach lab analyzed data to this form) 29.31 °C Air Temp INTSS/V99 24.53°C Water Temp Ammonia-N 6.38mg/1 DO || Nitrate-Nitrogen pH 7.81 BOD Conductivity 0.386mS/cm CBOD Other:_TP-TKN Salinity 0.15ppt 0.4m Secchi Depth 4 - MODERATE Flow severity

Bacterial Data Collection (attach bacterial results to this form)

1.07

Bacteria WE. Coli	Enterococcus Other:
Protocol Used	
Timed Average	Total timemin atmin intervals
Cross section	11 equally spaced samples every m (stream width/12)
Longitudinal	5 equally spaced samples every 250 m (reach length//4)
Vertical	Samples collected at surface, mid depth, and bottom

Stream Depth

Flow (**¢**FS)

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

Wadeable Streams – 5 equally spaced transects Starting at lower end or reach and ending at upper end of reach.

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
					8	A	610-	7						
						A								

Non-wadeable Streams - one transect at access point

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
33	60	*5	EE	BAC	K								1.7	Stope

Please verify	that you have	e completed a	Il sections,	checked all	applicable	boxes and	I that everyt	hing is
complete	0	11	Λ		T P P P P P P P P P P P P P P P P P P P	11107	. that everyt	11115 13

complete.		291 2057/17101	
Signed: Date:_	(Rey dwell >	628/07	
Organization:_	PBS+J	Position: Sci IL	

Flow	ele	LANSEL	TT		-
Loc De	- P T,+ (m	1 FLON 20%98	w(f)	PS) 2096	
Ft BANK	Reading	ann an tha ann ann an tha ann ann an tha ann ann an tha	and of the Andrew Construction	ninenty taxon of the system of the	
I	.33	· ·	25		
Ζ,	.33	× ,	24		
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9	. 33 . 33		15		
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iy	- 4	1 -	12		
15	- 67		.31		
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19	- 80	ł	.04	1.39	
20	1.2	1	.14	1.37	/
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22	-33		1.21)
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13-02-01	and the second sec	-67		1.07	
03-02-02		3.0		. 39	/
23-02-01	3	1.25		. 42	
13-02-04		2.0		, 33	
13-02-05		1.0		.53	

OTHER IN ED WATER; ODOR - NOWE LOLOR - BEN CLARITY - BOOR FLOW - MODERNIE SHEEN - NOWE FLONTABLES - LEANES ON LY NO DEBRIS

F	Field Data Sheets for		
		Site Characterizat	ion
Stream Segment Nar	ne Mill Cree	mpleted for each site)	
Stream Segment Nut	nber 200 4	1	The second of The
Station ID	(Station ID requir	Charten Barrish DE TOC fo	<u>nosegment</u> ID#
		CKert	1111)
	12010711300 W		\mathbf{D}
Site Location Descrip	otion (e.g., road crossing):	- materia	E Blebb-Ville
	ectors): PR, Kas	T'MT, 200	* B
Current Weather Cor	iditions: Cloudy	1 1	
weather Conditions	for Past 10 days:	dy Karby	(Showers)
Is there a WWTP at t	he site? 🗆 Yes 👌 No	1	
	charger	Dar	mit #
, , , , , , ,		I CI	iiiit #
Drought Conditions:	(Use Palmer Drought Severi	ty Index)	
□ Extreme	🗆 Incipient		□ Moderately Wet
□ Severe	🗆 Near Nor		□ Very Wet
		Wet Spell	□ Extremely Wet
□ Mild	Slightly	Wet	
Site Location: X	30.02868 Y	-9.6.400	-4-3
LOCATION COORD	DINATES (Please Indicate co	ordinate system used for	data collection):
Latitude Longitude	Datum: NAD 27	or NAD 83	data concerton).
State Plane	Datum: NAD 27		ne
UTM	_ Datum: NAD 27		ne
Global Positio Static Mode Dynamic Mode (Kine Precise Positioning Se Signal Averaging Real Time Differentia WARS were St HORIZONTAL ACCU	ning System (GPS) matic) rvice I Processing Can Augure 101 for System URACY ESTIMATE a Quality Meters	Inte Topographic Aerial Photo Satellite Ima Interpolation	erpolation Data Quality Scale: 1:24,000 1:100,000 Other
		ٽٽ	Meters
Uses Observed: (Uses	actually observed at time of	site visit.)	
Swimming	T 337-4- 1 ···		
 Swimming Skin diving 	 Water skiing Wind surfing 	Canoeing	□ Trapping
SCUBA diving	\Box Wind surfing \Box Kayaking	Wading Rafting	□ Fishing
□ Tubing	\Box Boating	\Box Hunting	Other
	outing	_ munning	None.
Describe: (Include number o	f individuals recreating, photo-docur	mentation of evidence of recre	ational uses, etc. Use Data Sheet D-
cecreational Use Interview v	when conducting interviews.)	int	

00

	Surrounding (Conditions: (Mar	k all that p	promote or in	npede recreatio	nal uses. Attach pho	tos of evidence
	or unusual item	s of interest.)				¥	
	City/county par	rks 💷 I	Industrial		1 State park	S 1_	No trespass sign
	Playgrounds	t	Urban		J National f		Fence
	🗋 Wildlife		Campground	ds .	. Nature trai	ls	Steep slopes
	🗋 Residential	I	Boating acco	ess	Stairs/wall		Other:
	Comments:	vore		ŷ			
	Indications of I	Human Use: (att	tach photo	os)			
	Roads		R	V / ATV Tra	cks	□ NPDES D	isaharaa
	□ Rope swings			amping Sites			
	□ Dock/platform	n		re pit/ring		□ Livestock □ Other	watering
	☐ Foot paths/pri			shing Tackle			
	Comments:	None		5			
	Photos (attach a	dditional sheets i	f needed)				
DS CO65 DSC0655 DSC0655 -DSC	97 Shou	urpose State	Photo	DWnstream P D# Photo	Purpose	Other Pho Photo ID# Photo	tos Purpose
	Stream Morpho	logy		/			
	Upstream View ³ Is there any water If so, is there and Select one of the	r present at this v bvious current?	view? 🗤	Yes 🗆 No Yes 🗆 No			
Г	Channel Feature	Distance from acc	er reatures:	Width (m)	Langth (m)	M. I. D. H. I.	
-	RIFFLE	Distance from act	LC55 (III)		Length (m)	Median Depth (m)	Max. Depth (m)
X	RUN	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		4	20		
4	POOL	(\mathcal{O})		4.6			
			1			1	1

Downstream View's Physical Dimensions:

Is there any water present at this view?	🗆 Yes	🗆 No
If so, is there an obvious current?	🗆 Yes	🗆 No

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	6	All	40	(and the second s	
POOL					

	Substrate (Thes	se values should add	up to 100%.)				
	77 Cobble	% Gravel	% Sand	% Silt	% Mud/Clay	% Bedro	ck
	0	0	-50	25	- 25	0.	
	Aquatic Vegeta	tion (Note amount of	vegetation or al	gal growth at the a	torn of St ssessment site)	rearry - O	edments
7							28 R
/							banka
1	Water Characte	eristics: (Mark all the	t apply.)				3
	Algae Cover:	absent 🗆 rare	Common]abundant ⊡don	ninant		
	Odor:		□acrid □se	wage \Box rotton eg	gg □fishy □m	lusky	
	Color:	□ no color □ ligh	it green 🗆 dar	k green 🗆 tan		1	
	Water Surface:	\Box sludge \Box solids \Box clear \Box scum		ents □none □ lebris □ sheen	other Lyb	thrown	
	water Surface.			leons 🗆 sneen	v		
/	Comments: (Plea	se attach any additio	nal comments to	this form).			
	TR		ved F		arubs bes	neath	
0	the w		Jace, t	he br		law sing	editor
No	t certo	min, if the	V are	aquat:		J	t.d.
	complete.	t you have completed	all sections, che	cked all applicable	boxes and that eve	erything is	
			-)		1 -1	
	Investigator's Sig	gnature: Pov-t-	va Kannad	Date of Sur	vev. 06 20	(0)	
	Organization: P	BSBJ			Enone	eer 11	
				5.0 SD	T		
		14			U		

.....

Field Data Sheets for Contact Recreation UAA				
Data Sheet	C - Water Quality Data and Depth Measurements			
Stream Name(OCreek Segment # 4- Fast Absegment ID# Station ID 4			
Water quality data only ne Stream Width at Access P Total length of reach asses				
Secchi Depth	Parameters Collected for Lab Analysis (15-0.75) $^{\circ}$ C \mathbb{R} TSS/M99 $^{\circ}$ C \mathbb{R} TSS/M99 $^{\circ}$ C \mathbb{R} Ammonia-N mg/l \mathbb{R} Nitrate-Nitrogen \mathbb{R} CBOD ppt \mathbb{P} Other: $\underline{\mathcal{T}} \underline{\mathcal{P}}^{-} . \underline{\mathcal{T}} \underline{\mathcal{K}} N$			
Bacteria B E. Coli D Protocol Used Timed Average Cross section Longitudinal	(attach bacterial results to this form) Enterococcus			

Stream Depth

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

Depth. Stream 2-75 bt

Wadeable Streams – 5 equally spaced transects Starting at lower end or reach and ending at upper end of reach.

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
15H	50									-			0.79	65
	•									()	-00	r a	t be	243

Non-wadeable Streams - one transect at access point

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point Port	t Point	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
------------------------	-----------------------	------------	---------	------------	------------	------------	---------	---------	------------	-------------	-------------	------------------	------------------------

Signed: Date: 06 29 67 Organization: BS4-

Position: Prince

	Field	Data Sheets for Conta	ct Recreation UA	A				
		Data Sheet B - Site Cha	racterization					
		(must be completed for						
		Jest Fork Mill C	reek					
	Stream Segment Number Station ID \cup A A ((Station ID/requires submitta	0 Segment 10	IE				
	Station ID CCITIN		II OI SLOC IOIIII)					
	Date & Time: 7/11/07	14:00						
	Site Location Description (e	e.g., road crossing): West Fort	M. Mcseek at In	Instry				
	Personnel (Data Collectors):	: John Branom, " Rartly Cloudy d	Tesse Maya	1				
	Weather Conditions for Page	10 darmy Cloudy of	Calm 35.5	7/1/17				
	Weather Conditions for Fast	t 10 days: bast signifi	can lainfall way	415107				
	Is there a WWTP at the site?	? Yes No						
	If yes, Name of Discharger		Permit #	×				
	1250	Calmer Drought Severity Index)	N/- 1					
	L Extreme	Incipient Dry Spell Near Normal		erately Wet				
	∐ Moderate	Incipient Wet Spel		emely Wet				
	∃ Mild	Slightly Wet						
	1	0.00	1-1-5-21					
(Site Location: X 29.98368 Y -96.46536 LOCATION COORDINATES (Please Indicate coordinate system used for data collection):							
		ES (Please Indicate coordinate s Datum: NAD 27 or NAD 8		ction):				
	State Plane	Datum: NAD 27 or NAD 8	3 Zone					
¥	UTM	Datum: NAD 27 or NAD 8						
april								
See Event # I data # 52 eets	HORIZONTAL COLLECT	ION METHOD (Indicate the me		ne locational data.)				
90 1 0 yg/	Global Positioning S Static Mode	System (GPS)	Interpolation Topographic Map or I)RG				
# eer {	Dynamic Mode (Kinematic))	Aerial Photograph or I					
42	Precise Positioning Service		Satellite Imagery					
	Signal Averaging		Interpolation Other					
	Real Time Differential Proc							
	WAAS- Wede Area HORIZONTAL ACCURAC							
(GPS Data Qua		Internolation	ı Data Quality				
1		eters	Source Map Scale:	1:24,000				
	$EPE \pmFeet or \pmFeet$	Meters	88	1:100,000				
	PDOP			Other				
			\pm Feet or \pm _	Meters				
	Uses Observed: (Uses actua	ally observed at time of site visit	.)					
	Swimming		Canoeing	Trapping				
	Skin diving		Wading] Fishing				
	SCUBA diving		Rafting	Other				
	1] Tubing	Boating	Hunting	E None				
	Describe: (Include number of indiv	iduals recreating, photo-documentation of	of evidence of recreational uses	, etc. Use Data Sheet D-				
		onducting interviews.)						
		*	•					

Surrounding Conditions: (Mark all that promote or ir	npede recreational uses. Attach	photos of evidence
or unusual items of interest.)		
City/county parks	1 Industrial	State parks	🗌 🔀 trespass sign
Playgrounds	Urban	National forests	Fence
Wildlife	☐ Campgrounds	Nature trails	Steep slopes
] Residential	Boating access	Stairs/walkway	Other:
Comments: There the sample	is a borbel point that	wire fence ju	st west of othe stream.
		1	

Indications of Human Use: (attach photos)

- Roads
- Rope swings
- Dock/platform
- ☐ Foot paths/prints
- ☐ RV / ATV Tracks ☐ Camping Sites ☐ Fire pit/ring ☐ Fishing Tackle
- NPDES Discharge
 Livestock Watering
- Other

Comments: N/A

Photos (attach additional sheets if needed)

Upstream	Photos	Downst	ream Photos	Other Photos	
	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
	Sample Collection site	1 (4)	View		
1(1)	Flow + depth Measurnent	1(5)	VIEW		
1(2)	View	1(6)	VIEW		
1(3)	View				

Stream Morphology

Upstream View's Physical Dimensions:

Is there any water present at this view?	Yes	1] No
If so, is there an obvious current?	Yes	

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN)	0	3.96	40		
POOL					

Downstream View's Physical Dimensions:/

Is there any water present at this view?	Yes	1 No
If so, is there an obvious current?	Yes	1 No

	Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
	RIFFLE					
0	RUN	Ô	3.96	AD		
	POOL					

Substrate (These values should add up to 100%.)

% Cobble Z % Gravel Z % Sand % Silt 70% Mud/Clay	Bedrock
--	---------

Aquatic Vegetation (Note amount of vegetation or algal growth at the assessment site) Therease grance aquatic macro phytes growing in a challow area which has a night peacent gravel content.

Water Characteristics: (Mark all that apply.)

Comments: (Please attach any additional comments to this form). Nogeration growing well along the banks. Debris have been flushed down stokan (i.e. logs).

h P P P	
Investigator's Signature:	Date of Survey: 7/11/07
Organization: PSS+5	Position: Sr. Scientist

Fleid Dat	a Sneets for Contact Recreation UAA						
Data Sheet C - W	Data Sheet C - Water Quality Data and Depth Measurements						
	CK Segment # West Bork Station ID (LAA)						
Water quality data only needs to l	be collected at the stream access point.						
Stream Width at Access Point 3.96 metersTotal length of reach assessed 150 meters (stream width x 40) 150 m minimum - 500 m maximum							
Field Parameters	Parameters Collected for Lab Analysis						
Air Temp 35.30° CWater Temp $2g.23^{\circ}$ ° CDO 10.18° mg/lpH 7.84° Conductivity 529μ %/cmSalinity 0.15° pptSecchi Depth 0.46° Flow severity 3° Flow (CFS) 4.06°	(attach lab analyzed data to this form) TSS/VS9 Ammonia-N Nitrate-Nitrogen BOD CBOD Other: <u>T-Phosphorus</u> TKN						
Restarial Data Callesting (1) 1 1 1 1							

Bacterial Data Collection (attach bacterial results to this form)

Bacteria JE. Coli	Enterococcus Other:
Protocol Used	
Timed Average	Total timemin atmin intervals
Cross section	11 equally spaced samples every m (stream width/12)
Longitudinal	5 equally spaced samples every m (reach length//4)
Vertical	Samples collected at surface, mid depth, and bottom

Stream Depth

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

Wadea of read	able Stream ch.	s – 5 equally spaced transects Starting at lower end or reach and ending at upper end
	-	

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
3.96	BD	S	eel	Zeve	rse	Sid	5						0.38	Slope

Non-wadeable Streams - one transect at access point

Stream- Width (m)	Point 1	Point 2	Point 3	Point 4	Point Proint	t Point	Point 8	Point 9	Point	Point	Thalweg Depth	Bank
					Vegto	14 -						Slope

Signed: Date:	6500 7/n/07
Organization	BS+J

Position: 20 Scientist

	Flow Trans	sect
Loc	Depth (m)	Velocity (EFS)
set	0.05	0.05
Serve Z	0.13	0.02
3	0,20	0.04
4	0.23	0.09
5	D.28	0.14
6	0.30	0.18
汗	0.33	0.26
B	0-33	0-38
9	Qc 36	0-22
10	0-36	0.65
11	0.38	0.64
12	0.38	0.67
13	0-38	0-68
14	0.33	D.55
15	0,36	0.35
16	0-33	0.35
17	0-33	0.19
18	0.30	0.02
19	0.25	0.00
24.	0.18	D. 00

24. Beinc

	Field D	ata Sheets for Contac	t Recreation UA	A						
		Data Sheet B - Site Char	racterization							
		(must be completed for e	each site)							
	Stream Segment Name	MillCreek								
	Stream Segment Number	HAA mc-2-	120215							
	Station ID UAA 2	_ (Station II) requires submittal	of SLOC form)							
	Diami Milan	Glot								
	Date & Time: 7/11/07 /		1 1542 9	2-70						
	Bersonnel (Data Collectors):	., road crossing):	Topo Mana	FJ9						
	Personnel (Data Collectors): John Branom, Jesse Moya Current Weather Conditions: Partly Cloudy 32.07									
	Weather Conditions for Past 1	0 days: ast day of	Frainwas 7/6	207						
				4						
	Is there a WWTP at the site?	JYes No								
	If yes, Name of Discharger_		Permit #							
	0									
1	Drought Conditions: (Use Pal.	0		1 ***						
/	Extreme	Incipient Dry Spell		erately Wet						
	 Severe Moderate 	Near Normal		mely Wet						
A.] Mild	Slightly Wet	12 Exuc	mery wet						
1 eel X										
See dota death	Site Location: X Z9.	89679 y~96.	. 25499							
to the	LOCATION COORDINATES	S (Please Indicate coordinate sy	stem used for data colle	ction):						
e in	Latitude Longitude D	Datum: NAD 27 or NAD 83								
ge of	State Plane D	Datum: NAD 27 or NAD 83		<u>1</u> 2010						
then <	UTM D	Datum: NAD 27 or NAD 83	Zone							
	HORIZONTAL COLLECTIC	ON METHOD (Indicate the method	had used to determine th	e locational data)						
	Global Positioning Sys		Interpolation	ie locational uata.)						
/	Static Mode		Topographic Map or D	RG						
/	Dynamic Mode (Kinematic)		Aerial Photograph or I							
	Precise Positioning Service		Satellite Imagery							
(Signal Averaging		Interpolation Other							
4	Real Time Differential Proces	sing								
	WARS- Wode Area /									
	HORIZONTAL ACCURACY		Interpolation	Data Quality						
	GPS Data Quali FOM ± Mete		Source Map Scale:	Data Quality 1:24,000						
	$EPE \pm Feet \text{ or } \pm$	Meters	Source map Seure.	1:100,000						
	PDOP			Other						
			±Feet or ±	Meters						
	Uses Observed: (Uses actuall	ly observed at time of site visit.)								
			- ·	· · ·						
			Canoeing Wading	☐ Trapping ✓ Fishing						
		5	Rafting	Other						
	5	, .	Hunting							
	12 Tuong		Tunning							
	Describe: (Include number of individu	uals recreating, photo-documentation of	evidence of recreational uses.	, etc. Use Data Sheet D-						
	Recreational Use Interview when con-	ducting interviews.) NO people	e where observe	ed: however,						
	old trothline us	sses had been dump	the shore line	Also, an						
	of the bridge on	the Northern han	C.)						
	~									

Surrounding Conditions: (.	Mark all that promote or imp	ede recreational uses. Attach	photos of evidence
or unusual items of interest.)			
City/county parks	Industrial	_ State parks	l No trespass sign
Playgrounds	Urban	National forests] Fence
] Wildlife	Campgrounds	☐ Nature trails	Steep slopes
Residential	Boating access	L Stairs/walkway	dther:
Comments: Evolded	banks with	concrete Fip-ro	y makes

Indications of Human Use: (attach photos)

Roads	I RV / ATV Tracks	NPDES Discharge			
Rope swings	L Camping Sites	Livestock Watering			
Dock/platform Foot paths/prints	J Fire pit/ring	1] Other			
Comments: Found	a fishing lure on the	bancand some riggi			

ip on a tree branc

Photos (attach additional sheets if needed)

PI

una

Upstream Photos	Downst	ream Photos	Othe	r Photos
Photo ID# Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1(0)-1(2) Obstruction introntof Bridge	1(9)	VIEW		
1(3) ARER SAMPles Collected				
1(4)-1(5) Hog Remains				
1(6)-1(8) VIEW	1(17)			

Stream Morphology

nthe

Upstream View's Physical Dimensions:

Is there any water present at this view?	Yes] No
If so, is there an obvious current?	Yes] No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	0	24	250	-	
POOL					

Downstream View's Physical Dimensions

Is there any water present at this view?	Yes	1 No
If so, is there an obvious current?	Yes	1] No

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	0	30	250	-	~
POOL					

bstrate (These v		30 % Sand		20	
% Cobble	% Gravel	/ % Sand	% Silt	70% Mud/Clay	% Bedrock

Aquatic Vegetation (Note amount of vegetation or algal growth at the assessment site)

Water Characteristics: (Mark all that apply.)

Algae Cover:	absent] rare	Common Dabundant Idominant	
Odor:	none	Joil	acrid Isewage Irotton egg Ifishy, Imusky	
Color:	🗋 no color	🗌 light	nt green dark green d tan dred green brown d b	lack
Bottom Deposit:	🗌 sludge	□ solids	fine sediments lother	
Water Surface:	clear	scum	🗆 foam 🗋 debris 🗋 sheen	

Comments: (Please attach any additional comments to this form). No dur enningated from the water; however, the presence of dead animals on the shore/bane did give the whole grea a rancial odor.

Investigator's Signature:	Date of Survey: 7/11/07 Position: Sr. Scientist.
\bigcirc	

Field Data Sheets for Contact Recreation UAA Data Sheet C - Water Quality Data and Depth Measurements

Stream Name_Mill Creek_____ Segment #_ 20212

Station ID UAAZ

Water quality data only needs to be collected at the stream access point.

Stream Width at Access Point	24	meters
Total length of reach assessed	150	meters (stream width x 40) 150 m minimum - 500 m maximum

Field Parameters

Air Temp	<u>37.07 °</u> C
Water Temp	<u>Z8.76°</u> C
DO	5.55 mg/l
pH	7.88
Conductivity	49Zuslen
Salinity	0.23 ppt
Secchi Depth	1.25'
Flow severity	3
Flow (CFS)	56-13

Parameters Collected for Lab Analysis (attach lab analyzed data to this form) TSS/VSS Ammonia-N □ Nitrate-Nitrogen BOD 1] CBOD POther: T- Phosphones

Bacterial Data Collection (attach bacterial results to this form)

Bacteria 🛛 🕑 E. Coli	□ Enterococcus □ Other:	
Protocol Used		
Timed Average	Total timemin atmin inte	rvals
Cross section	11 equally spaced samples every	m (stream width/12)
Longitudinal	5 equally spaced samples every	m (reach length//4)
Vertical	Samples collected at surface, mid dep	th, and bottom

Stream Depth

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

Wadeable Streams – 5 equally spaced transects Starting at lower	end or reach and ending at upper end
of reach.	0

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point	Point	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
						Ę	to	67						

Non-wadeable Streams - one transect at access point

Stream Width	Left Bank	Point	Thalweg Depth	Right Bank										
(m)	Slope	1	2	3	4	5	6	7	8	9	10	11		Slope
24	60	×	se	e Re	werg	es	pole						0.5m	85

Please verify that you have completed all sections, checked all applicable boxes and that everything is complete.

JINOT Signed: Date: Organization

Position:

Sr. Scientret

	Flow Transe	ect
Lcc.	Depth (m)	Velocity (2FS)
sent 1	0.43	0.58
2	0.48	0.54
3	0.46	0.50
4-	0.28	0.54
5	0.31	0.51
6	0.36	0.4-3
07	0.46	0.47
8	0.51	0.47
9	0.56	0.46
10	0154	0-49
)	0.56	0.50
12	0.51	0.55
13	0.46	0.57
14	0.43	
15	0.48	0.55
16	0-61	0.47
17	0.64	0.43
18	0.58	0.39
19 20	0.51	0.36
Rt.	0.46	0.Lt

Kt. Banc

	Field	Data Sheets for Co	ntact Recreation U	JAA			
		Data Sheet B - Site					
	Stream Segment Name E Stream Segment Number Station IDUAA	(must be complete SST For (L Mi) LAHA-MC-4 (Station II) requires sub	1 Craele	∑#			
	Personnel (Data Collectors) Current Weather Condition	SI	Creekat Eucke. Desse Mou	19			
	Is there a WWTP at the site If yes, Name of Discharge		Permit #				
Seedatu sheet	☐ Extreme ☐ Severe ☐ Moderate ☐ Mild	Palmer Drought Severity Ind I Incipient Dry Near Normal Incipient Wet Slightly Wet	Spell December 2015	oderately Wet ery Wet tremely Wet			
	Static Mode Dynamic Mode (Kinematic Precise Positioning Service Signal Averaging Real Time Differential Prod MAAS - Wide Act HORIZONTAL ACCURAG GPS Data Qu	Datum: NAD 27 or NA FION METHOD (Indicate the System (GPS)	ate system used for data co AD 83 AD 83 Zone ate method used to determine Interpolatio Topographic Map or Aerial Photograph o Satellite Imagery Interpolation Other 9 e	the locational data.) The DRG The DOQQ			
	Uses Observed: (Uses actu	Uses Observed: (Uses actually observed at time of site visit.)					
	 Swimming Skin diving SCUBA diving Tubing Describe: (Include number of indivination) 	U Water skiing Wind surfing Kayaking Boating viduals recreating, photo-documenta	Canoeing Wading Rafting Hunting	Trapping Fishing Other Found Sees, etc. Use Data Sheet D-			
	Recreational Use Interview when o	conducting interviews.) NA					

Surrounding Conditions:	(Mark all that promote o	r impede recreational uses.	Attach photos of evidence				
or unusual items of interes	t.)		-				
City/county parks	Industrial	State parks	No trespass sign				
] Playgrounds	🗇 Urban	National forests	Fence				
Wildlife	☐ Campgrounds	Nature trails	Steep slopes				
Residential	☐ Boating access	Stairs/walkway	Other:				
Comments: Barbedwire fence running parallel to road and Stream after 1st bend and the upstream side of the Euchert Rd. Bridge. Indications of Human Use: (attach photos)							
Roads	L RV / ATV	Trooka	NDDEC Discharge				
Rope swings	Camping S		NPDES Discharge Livestock Watering				
Dock/platform	☐ Fire pit/rin		Other				
Foot paths/prints	□ Fishing Ta	0	Ouler				
12 I OOL Patilo/ Plillo		UNIC					

Photos (attach additional sheets if needed)

Comments: NA

Upstream	Photos	Downst	ream Photos	Othe	r Photos
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
1 - 1(2)	Obstruction in Front of Budge	1(7)	Downstream	VIEW	
1(3)	View Upstream				
1(4)	Anex Samples Collected				
-	()			<u></u>	

Stream Morphology

Upstream	View's	Physical	Dimensions:	1

	J	
Is there	any water present at this view?	1 Yes
If so, is	there an obvious current?	Yes

Yes INO

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	0	4.57	20	-	
POOL					

Downstream View's Physical Dimensions:

Is there any water present at this view?	PYes] No
If so, is there an obvious current?	Yes	1] No

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE		1			
RUN	0	4.57	40		
POOL					

Substrate (These va	lues should add	l up to 100%.)			
% Cobble	% Gravel	40 % Sand	% Silt	& Mud/Clay	% Bedrock

Aquatic Vegetation	(Note amo	unt of vegetat	tion or algal gro	wth at the asse	essment si	te) Veeete	atra
asoning	Nen	onthe	bancs	either	sple	ofthe	
O GAR tool	~ ~				- Carlos - C		
				and the second se			

Water Characteristics: (Mark all that apply.)

Algae Cover:	absent	□ rare	Common Cabundant Cominant	
Odor:	Unone	Joil	acrid Isewage Irotton egg Ifishy Imusky	
Color:	🗌 no color	light	t green dark green d tan dred green/brown	black
Bottom Deposit:	🗋 sludge	solids	fine sediments Inone Jother	
Water Surface:	clear	scum	foam debris sheen	

Comments: (Please att	ach any ac	ditional comments	to this form).	Alarge	tree/log	is
up against	the	4 D stream	~ side	ofthe	Suchert	Rd.
Badae		1			CAL	

Investigator's Signature:	Date of Survey:	7/14/07
Organization: 10547	Position: SF.	Scientist

Field Data Sheets for Contact Recreation UAA Data Sheet C - Water Quality Data and Depth Measurements

Stream Name Fost Fork Mill Creek Segment # Lost Fork Station ID /

Water quality data only needs to be collected at the stream access point.

Stream Width at Access Point	4.57 meters
Total length of reach assessed	150 meters (stream width x 40) 150 m minimum - 500 m maximum

Field Parameters

Air Temp Water Temp DO pH Conductivity Salinity Secchi Depth Flow severity Flow (CFS)	32,45° C 28,260° C 5,50 mg/l 7.84 608,15/cm 0.29 ppt 0.53 m 3 10-58
110w (C1.5)	10-20

Parameters Collected for Lab Analysis (attach lab analyzed data to this form) TSS Ammonia-N Nitrate-Nitrogen BOD CBOD Dother: T-Phosphorns

Bacterial Data Collection (attach bacterial results to this form)

Bacteria 🛛 🗹 E. Coli	Enterococcus Other:
Protocol Used	
Timed Average	Total timemin atmin intervals
Cross section	11 equally spaced samples every m (stream width/12)
Longitudinal	5 equally spaced samples every m (reach length//4)
Vertical	Samples collected at surface, mid depth, and bottom

Stream Depth

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

Wadeable Streams – 5 equally	spaced transects Starting at lower end or reach and ending at upper end
of reach.	a contra character cha or reach and enuing al upper ena

Stream Width (m)	Left Bank Slope	Point 1	2	Point 3	4	5	Point 6	7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
4.57	50		ESe	e Re	ever	se :	3124	>					0.33	65

Non-wadeable Streams - one transect at access point

Stream Width (m)	NO 2 CONTRACTOR	Point 1	Point 2	Point 3	Point Point	Point 6	Point 7	Point 8	Point 9	Point	Point	Thalweg Depth	Bank
					80	04							Slope

-7/n/07 Signed: Date: Position: Organization:

Sr. Scientis

	Flow Transect	
Reft Loc.	Depth (m)	Flow(FS)
Bane	0.05	0.49
Z	0.10	0.70
3	0.15	0.68
4	0.18	D.66
5	0.20	0.75
6	0.25	0-82
7	0.31	0.84
B	0,33	0.74
9	0:33	0.85
10	0-38	0-81
11	0.41	0,78
12	0.46	0-75
17	0.46	0.78
14	0.48	0.76
15	0.46	0.73
16	0.46	0.74
17	0.43	0.63
18	0.36	0.41
19	0.28	0.26
24, 20	0.13	0-00

Zt, Bane

	Field	Data Sheets for Co	ntact Recreati	on UAA				
	Data Sheet B - Site Characterization							
	(must be completed for each site)							
	Stream Segment NameY	Mill Creek We	St Fork					
	Stream Segment Number	WAA DE DT NO	Segment ID	#				
	Station ID OTTA	(Station II) requires sub	mittal of SLOC form)				
	Date & Time: 7/74/07	7 11:17						
	Site Location Description (e.g., road crossing): Trad	ustry Rd. of T	Ave have Rd.				
	Personnel (Data Collectors)	1: Dure Schletzkus K	of Com Talin	Branom				
		S I - CETTU / LOUID						
	weather Conditions for Pas	st 10 days: rainy; No	antecedent d	ry period				
	Is there a WWTP at the site	? Yes No						
	If yes, Name of Discharge		Permi	t #				
				L IT				
		Palmer Drought Severity Ind						
	Extreme	Incipient Dry	Spell	Moderately Wet				
	☐ Severe ☐ Moderate	Near Normal	G 11	Very Wet				
		Incipient Wet Slightly Wet	Spell	Extremely Wet				
(.98388 Y -	76-4653	6				
	LUCATION COORDINATES (Please Indicate coordinate system used for data self-stimu)							
14	Latitude Longitude State Plane	Datum: NAD 27 or NA	D 83					
alot a)	UTM	Datum: NAD 27 or NA Datum: NAD 27 or NA	D 83 Zone D 83 Zone	The second				
set for				()				
Secolata Sheets from Sheets 1	HORIZONTAL COLLECTION METHOD (Indicate the method used to determine the locational data.)							
she y 1	Global Positioning S	System (GPS)		olation				
tr	Static Mode		Topographic N					
wen	Dynamic Mode (Kinematic) Precise Positioning Service)		raph or DOQQ				
	Signal Averaging	Satellite Image	polation Other					
	Real Time Differential Proc	essing						
	WAAS-Wide Area	Auguentation Syster	~					
	HORIZONTAL ACCURAC							
	GPS Data Qua FOM ± Mo			polation Data Quality				
($EPE \pm Feet or \pm$		Source Map So					
	PDOP	IVICICIS		1:100,000 Other				
			±Fe	et or ± Meters				
	Uses Observed: (Uses actually observed at time of site visit.)							
	Swimming Skin diving	Water skiing	Canoeing	Trapping				
	SCUBA diving	Wind surfing Kayaking	Wading	Fishing				
	Tubing	Boating	Rafting	Other				
	c	<u> </u>	U					
	Describe: (Include number of indivi-	iduals recreating, photo-documentat	ion of evidence of recreati	onal uses, etc. Use Data Sheet D-				
	Describe: (Include number of indivi Recreational Use Interview when co	onducting interviews.)	nl					

Surrounding Conditions: (or unusual items of interest.	Mark all that promote or imp	ede recreational uses. A	ttach photos of evidence.
City/county parks	Industrial	State parks	No trespass sign
Playgrounds	Urban	National forests	Fence
Wildlife	Campgrounds	Nature trails	Steep slopes
Residential	Boating access	Stairs/walkway	Other:
Comments: Three of impeded by fu	the four acress incing of by hig	points of this Vistorp sloped	banks.
Indications of Human Use:	: (attach photos)		
Roads	RV / ATV Trac	cs 11	NPDES Discharge
Rope swings	Camping Sites		Livestock Watering
Dock/platform	Fire pit/ring		Other
☐ Foot paths/prints	☐ Fishing Tackle		
Comments:	one		

Photos (attach additional sheets if needed)

Upstream	Photos	Downst	ream Photos	Other	r Photos
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
8-5	documentation	7-5	documentation-	1-5	documentation
			1	3-5	11
			2	4-5	
				6-5	<u>t (</u>

Stream Morphology

Upstream View's Physical Dimension	s: /	
Is there any water present at this view?	Yes	1] No
If so, is there an obvious current?	Yes	I. No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	Ð	4-10	40	0.43	0.71
POOL					

Downstream View's Physical Dimensions;

Is there any water present at this view?		JNo
If so, is there an obvious current?	Yes	No

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE	Ø	4.10	40	0.31	0.50
RUN	- O APS-124/0	7			
POOL	- June 1/ 1/				

Substrate (These values should add up to 100%.)

% Cobble	15% Gravel	ZO % Sand	15 % Silt	50 % Mud/Clay	% Bedrock
					10 Dedroen

Aquatic Veget	ation (Note amount of veg	getation or algal growth at th	ne assessment site)	SPACEP
aquatic	macrophytes,	both emergent	+ Submeccol	-jai - c
D				

Water Characteristics: (Mark all that apply.)

Algae Cover:	absent] rare	Lommon Labundant Ldominant	
Odor:	inone	Joil	Jacrid Jsewage Irotton egg Ifishy Imusky t green I dark green I tan Ired Ired Ired	
Color:	11 no color	🗆 light	t green d dark green d tan dred green brown d black	k
Bottom Deposit:	sludge	solids	fine sediments lother	
Water Surface:	clear	⊥ scum	foam debris sheen	

Comments: (Please attach any additional comments to this form).

Des 7/74/07 Date of Survey:_____ Position: ______ 107 Investigator's Signature: Organization:

Field Data Shee	ets for Contact Recreation UAA
Data Sheet C - Water	Quality Data and Depth Measurements
Stream Name_Mill Creek	905-8/6/07 Station 10 01.111
Water quality data only needs to be collec	ted at the stream access point.
Stream Width at Access Point Total length of reach assessed	meters meters (stream width x 40) 150 m minimum - 500 m maximum mw & 7/08 Per comm w/ JRB
Field Parameters	Parameters Collected for Lab Analysis
Air Temp $26.26 \circ C$ Water Temp $26.41 \circ C$ DO 6.35 mg/l pH 258 Conductivity 0.514 mSkm Salinity 0.25 ppt Secchi Depth 0.61 Flow severity $3-normal$ Flow (CFS) 26.56	(attach lab analyzed data to this form) ☐ TSS//99 ☐ Ammonia-N ☐ Nitrate-Nitrogen ☐ BOD ☐ CBOD ☐ Other: <u>TF-TKN</u>
□ Cross section 11 equally space □ Longitudinal 5 equally space	

Stream Depth

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

Wadeable Streams - 5 equally spaced transects Starting at lower end or reach and ending at upper end	h
of reach.	

Stream Width (m)	Left Bank Slope	Point 1	Point 2	3	4	5	Point 6	7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
4.5	30	0.15	0.31	0.38	0.58	arel	0.64	0.01	0.61	0.64	264	0.70	De laten	80
		0.01	0.28	0.59	0:87	1134	1.20	1.44	1.43	1.51	1-52	1.28		
		0.64	0,56											
		0.91	-0.43											
		Pt.12	84.13		8									

Non-wadeable Streams - one transect at access point

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point	Point	Point	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
						01	Giu	100						Stope

7/74/07 Signed: Date: Organization:

_Position:	Sa	Scientos.	+
_ Position:	26 -	Scientos.	/

	Field	Data Sheets for Con	tact Recreatio	n UAA								
	Data Sheet B - Site Characterization											
	(must be completed for each site)											
	Stream Segment Name MSILCreek Main Fork											
	Stream Segment Number WAA-WC-OZ or comment ID # 1202K											
	Station ID UAA Z (Station ID requires submittal of SLOC form)											
		861	0 (
	Date & Time: 7/25/0	9 11:00										
	Site Location Description (e.g., road crossing): mil	Clellat F.	m-24-29								
	Personnel (Data Collectors): John Branom;	Dyre Schlifz	=Ku s								
	Current weather Condition	1s: L- Partly Cloud	V '									
	Weather Conditions for Past 10 days: <u>Pain</u> ; we antecedent dry period.											
	Is there a WWTP at the site? Yes No											
	If yes, Name of Discharge	er	Permit 7	#								
		Palmer Drought Severity Index	.)									
	Extreme	Incipient Dry Sp	oell .	Moderately Wet								
	Severe	☐ Near Normal		J Very Wet								
	Moderate	pell	□ Extremely Wet									
	Mild Slightly Wet											
	Site Location: X 29.89679 Y -96. 25499											
(LOCATION COORDINATES (Please Indicate coordinate system used for data collection):											
	Latitude Longitude Datum: NAD 27 or NAD 83											
1.10	State Plane	Datum: NAD 27 or NAD	83 Zone									
dacor	UTM	Datum: NAD 27 or NAD	83 Zone									
reedate neets from neets to 1 went												
a pet it K	HORIZONTAL COLLECTION METHOD (Indicate the method used to determine the locational data.) Global Positioning System (GPS) Interpolation											
The the	Static Mode	System (GPS)		Interpolation								
, en	Dynamic Mode (Kinematic			graphic Map or DRG								
^y	Precise Positioning Service		Satellite Imager	al Photograph or DOQQ								
	Signal Averaging		Interpolation Ot									
	Real Time Differential Proc	cessing	interpolation Ot									
	WAAS- wide Area A	ingmentation system										
	HORIZONTAL ACCURAC	CYESTIMATE										
	GPS Data Qu	ality	Interp	olation Data Quality								
	FOM ±M	eters	Source Map Sca									
	$EPE \pm \Feet or \pm \Fe$	Meters		1:100,000								
	PDOP			Other								
			±Feet	or ±Meters								
	Uses Observed: (Uses actu	ally observed at time of site vis	sit.)									
	Swimming	Water skiing	Canadina									
	Skin diving		Canoeing	Trapping								
	SCUBA diving	e	□ Wading □ Rafting	J Fishing								
	Tubing	, c	Hunting	13 Other								
		Doume	1 munung									
	Describe: (Include number of indiv Recreational Use Interview when c	viduals recreating, photo-documentatio	n of evidence of recreation									
		Alac										
		None										

Surrounding Condition	ons: (Mark all that promote o	r impede recreational uses. A	Attach photos of evidence
or unusual items of inte		X	L
City/county parks	Industrial	⊥ State parks	□ No trespass sign
Playgrounds	Urban	□ National forests	1] Fence
U Wildlife	Campgrounds	Nature trails	Steep slopes
Residential	Boating access	Stairs/walkway	U Other:
Comments: The b and very sto Fap with p Indications of Human	pery then wet structing repar	wn to the wate There is a los that is dangere	t stconcrete ap
Roads	L RV / ATV	Tracks	NPDES Discharge
Rope swings	Camping S		Livestock Watering

Dock/platform Foot paths/prints	Fire pit/ring Fishing Tackle	Other		
Comments: there upstream gide	15 a rope swing 2 of the bridge ~	on the bank on the		

Photos (attach additional sheets if needed)

Upstream	Photos	Downst	ream Photos	Othe	r Photos
	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
20-5	documentation	19-5	documentation	16-5	documentation
				18-5	
				21-5	Obstruction
				265	decumentation

Stream Morphology

Upstream View's Physical Dimensions:

Is there any water present at this view?	Yes	No
If so, is there an obvious current?	Yes	I No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	05	29	79	047	0.7
POOL	~				

Downstream View's Physical Dimensions:

Is there any water present at this view?	Yes	No
If so, is there an obvious current?	Yes	1 No

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	Ø	29.	29	0.47	0.7
POOL					

Substrate (These va	lues should add	l up to 100%.)			
% Cobble	% Gravel	95 % Sand	5 % Silt	% Mud/Clay	% Bedrock
				9	
Aquatic Vegetation	(Note amount	of vegetation or alg	gal growth at the as	5 % Silt % Mud/Clay % Bedrock growth at the assessment site) Name	

Water Characteristics: (Mark all that apply.)

Algae Cover:	absent] rare	lommon labundant ldominant
Odor:	none	loil	acrid Isewage Irotton egg Ifishy Imusky t green I dark green I tan Ired I green brown I black
Color:	🔹 no color	🗆 light	t green I dark green I tan I red green brown I black
Bottom Deposit:	L] sludge	solids	fine sediments lother
Water Surface:	clear	l scum	foam debris sheen

Comments: (Please attach any additional comments to this form).

Date of Survey: 7/25/ Position: Sc. Sere 07 Investigator's Signatore Organization:

Field D	Field Data Sheets for Contact Recreation UAA									
Data Sheet C	- Water Quality Data and Depth Measurements									
Stream Name MillCre	12.021									
Water quality data only needs	to be collected at the stream access point.									
Stream Width at Access Point Total length of reach assessed										
Field Parameters	Parameters Collected for Lab Analysis									
Air Temp $76.67 \circ C$ Water Temp $76.46 \circ C$ DO 6.34 mg pH 7.73 Conductivity 0.527 Salinity 0.35 ppt Flow severity 5 Hyl Flow (CFS) 81.48	(attach lab analyzed data to this form) TSS/V99 Ammonia-N I Ditrate-Nitrogen BOD CBOD									
Bacteria E. Coli En Protocol Used Timed Average Tot Cross section 11 c Longitudinal 5 e	tach bacterial results to this form) tterococcus									

Stream Depth

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

	Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
20% or 40% low		80	.9' .07	2.3'	3,0	3,1'	3.4'	3.4'	3.4'	3.4'	3,2'	3.11	3.11	2.5'	60
80% (low			101	147	,36	36	,41	137	,29 ,38	,20	-32	,45	.39		
200:40% Aptu			30'	3.1'	3.0'	2.8'	2.51	2.31	2.0'	2.01	2.1'			0.6/m	
80% Flow			.48	,52	54	,52	.60		.68	1	10/1				

Wadeable Streams – 5 equally spaced transect	Starting at lower end or reach and ending at upper end
of reach.	o and the terminal and the starting as upper that

Non-wadeable Streams - one transect at access point

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point	2Point	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
						18	60	t						

-7/25/07 Signed: Date: 2 Position: SF. Sejent. 97 Organization:

F	ield Data Sheets for	Contact Recreation	on UAA			
	Data Sheet B - S	Site Characterization				
	millCreek(mustbegom	pleted for each site)				
Data Sheet B - Site Characterization Mill Creek (must be completed for each site) Stream Segment Name Mill Creek (must be completed for each site) Stream Segment Number HAA Mill Creek (must be completed for each site) Stream Segment Number HAA Station ID MAAAAA (Station ID requires submittal of SLOC form)						
Stream Segment Nun	iber AA-MC-64	= NO segment I	20 #			
	(Station Il Frequires	submittal of SLOC form)				
Date & Time: $07/2$	4/07 14:11					
Site Location Descrip	tion (e.g., road crossing):	nill Creak @ Upk	ert kl. West			
Personnel (Data Colle	ectors): Nure Shlitzk	us Vof Cana Tal	in Branom			
Weather Conditions f	or Past 10 days: <u>Roin;</u> N	10 antecedent dr.	y pernod.			
	he site? Yes No					
If yes, Name of Disc		Permit	4			
	1141 501	remit	#			
Drought Conditions: (Use Palmer Drought Severity	v Index)				
Extreme	Incipient	Dry Spell	Moderately Wet			
Severe	l Near Norr	mal	UVery Wet			
Moderate Mild	Incipient] Extremely Wet			
	Slightly V	Vet				
Site Location: X	30.02868 Y.	-96.40443				
LOCATION COORD	INATES (Please Indicate coo	ordinate system-used for day	ta collection).			
Latitude Longitude_	Datum: NAD 27 o	r NAD 83	w voncenonj.			
State Plane	Datum: NAD 27 o	r NAD 83 Zone				
UTM	Datum: NAD 27 o	r NAD 83 Zone				
HORIZONITAL COL	ECTION METHOD (In dias	4 de				
Global Positio	LECTION METHOD (Indica ning System (GPS)					
Static Mode	(GIS)	Interpo Topographic M				
Dynamic Mode (Kine	matic)	Aerial Photogra				
Precise Positioning Se	rvice	Satellite Imager				
Signal Averaging		Interpolation Or	ther			
Real Time Differentia WAAS-Wide A	Processing	~				
HORIZONTAL ACCI	TRACVESTIMATE					
	a Quality	Intorn	alation Data Quality			
FOM ±	Meters	Source Map Sca	olation Data Quality ale: 1:24,000			
EPE ± Feet of	or ±Meters	Source map bet	1:100,000			
PDOP	_		Other			
		±Fee	t or ± Meters			
Uses Observed. (Uses	actually observed at time of					
0303 00301 700. (0303	actually observed at time of	site visit.)				
Swimming	Water skiing	Canoeing	Trapping			
Skin diving	U Wind surfing	Wading	Fishing			
□ SCUBA diving	Kayaking	Rafting	d Other			
Tubing	Boating	Hunting				
Describe: (Include number o	f individuals recreating, photo-docur	nentation of avidance of the state	naliuman ata U. D. (C. D.			
Recreational Use Interview	when conducting interviews.)		nai uses, etc. Use Data Sheet D-			
	Aland	2				
	100					

ree dothing

Surrounding Conditions	: (Mark all that promote o	r impede recreational uses. Att	tach photos of evidence		
or unusual items of interest					
City/county parks	Industrial	State parks	1 No trespass sign		
Playgrounds	∣	1 National forests	Fence		
Wildlife	Campgrounds	☐ Nature trails	Steep slopes		
] Residential	Boating access	Stairs/walkway	Other:		
Comments: Fercing on both cides of stream as vellas steep slopes and gaved rails impede access.					
Indications of Human U	se: (attach photos)				
Roads	RV/ATV	Tracks	PDES Discharge		
Rope swings	Camping S		vestock Watering		
Dock/platform] Fire pit/rin		Ũ		
Foot paths/prints	Fishing Ta	ckle			
Comments:	tove				

Photos (attach additional sheets if needed)

Downst	ream Photos	Othe	er Photos
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
		10-5	documentation
		11-5	11
		13-5	LI
		14-5	<u> </u>
		Downstream Photos Photo ID# Photo Purpose	Photo ID# Photo Purpose Photo ID#

Stream Morphology

Upstream	View's	Physical	Dimensions:
----------	--------	----------	--------------------

Upstream view's Physical Dimension	s: /	
Is there any water present at this view?	Yes	1 No
If so, is there an obvious current?	Yes	1 No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	Ø	4.6	40	0.5	1.0
POOL					

Downstream View's Physical Dimensions:

Is there any water present at this view?	Vyes	1 No
If so, is there an obvious current?	Yes	1] No

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	Ø	4.10	40	0.5	1.0
POOL	/				

Substrate (These	e values should add	l up to 100%.)			
% Cobble	% Gravel	90 % Sand	(17 % Silt	% Mud/Clay	% Bedrock

Aquatic Vegetation (Note amount of vegetation or algal growth at the assessment site)

Water Characteristics: (Mark all that apply.)

Algae Cover:	absent	1 rare	Leommon Labundant Loominant
Odor:	none	Joil	lacrid lsewage lrotton egg lfishy lmusky
Color:	🗉 no color	🗆 light	t green I dark green I tan I red I green brown I black
Bottom Deposit:	l sludge	_ solids	V fine sediments none other
Water Surface:	🖌 clear	scum	foam debris debris

Comments: (Please attach any additional comments to this form).

Date of Survey: 7/24/07 Position: SR. Scientist Investigator's Signature 42 Organization:

Data Sheet C - Water Quality Data and Depth Measurements							
Stream Name Mill Creek Water quality data only needs to be collected	Segment # UAAA No segment ID # For IL						
Stream Width at Access Point15Total length of reach assessed150	meters meters (stream width x 40) 150 m minimum - 500 m maximum						
Field ParametersAir Temp $26.07 \circ C$ Water Temp $26.91 \circ C$ DO 5.87 mg/l pH 7.69 Conductivity 0.556 Salinity 0.27 ppt Secchi Depth 1.77 Flow severity 1.77 Flow (CFS) 21.54	Parameters Collected for Lab Analysis (attach lab analyzed data to this form) TSS/V54 Ammonia-N Nitrate-Nitrogen BOD CBOD Other: <u>TP, TKN</u>						
□ Longitudinal 5 equally space	Other:						

Field Data Sheets for Contact Decreation UAA

Stream Depth

velocity

11

velacit

11

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

	of rea	ch.			5 1			0					0	FF	
	Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
[46	450	7'	1'	1.2'	0.49m	0.55m	a64m	0.74m	0.76m	0.9km	1.07m	1.07m	7.07m	.70°
ty			0.35	0.73	0.91	0.84	0.87	0.80	0.89	0.87					

Wadeable Streams - 5 equally spaced transects Starting at lower end or reach and ending at upper end

Non-wadeable Streams - one transect at access point

DIZIM OBIMDIJA

Stream	Left	-					1						Thalweg	Right
Width (m)	Bank Slope	Point 1	Point 2	Point 3	Point 4	Point	Point	Point 7	Point 8	Point 9	Point 10	Point 11		Bank Slope
						1/5	SIL	07						

0.41

0.81

0.25

0.42

0,54 0. 9/m 0. 09/

0.3

Signed: Date:	7/26/07 180	_		
Organization:		Position:	Sr.	Seventist

	Sheets for Contac Sheet B - Site Cha	racterization	n UAA						
Stream Segment Name Mill Creek Stream Segment Number Unit Allo Segment TO Station ID HAP-MC-06-1 (Station ID requires submittal of SLOC form)									
Station ID (111) MC-06-1 (Station ID requires submittal of SLOC form) West Fork M/3 7/30/07 Date & Time: 7/30/07 13:35 Site Location Description (e.g., road crossing): <u>Industry Rd and Blue hole Rd</u> , Personnel (Data Collectors): <u>John Branom A Koti Sam</u> Current Weather Conditions: <u>Z-Birtly Cloudy</u> Weather Conditions for Past 10 days: <u>Rain</u> , No Antecedent day period.									
Is there a WWTP at the site? If yes, Name of Discharger	es No	Permit #							
Drought Conditions: (Use Palmer Drought Severity Index) Extreme Incipient Dry Spell Severe Near Normal Moderate Incipient Wet Spell Mild Slightly Wet									
LOCATION COORDINATES (Pleas Latitude Longitude Datum: State Plane Datum:	Y 76- re Indicate coordinate sys NAD 27 or NAD 83 NAD 27 or NAD 83 NAD 27 or NAD 83	stem used for data							
HORIZONTAL COLLECTION MET Global Positioning System (C Static Mode Dynamic Mode (Kinematic) Precise Positioning Service Signal Averaging Real Time Differential Processing WAAS-W de Area Arguest HORIZONTAL ACCURACY ESTIN GPS Data Quality FOM ± Matara	Hu 57570-	Interpola Topographic Map Aerial Photograp Satellite Imagery Interpolation Oth	ation Data Quality						
$FOM \pm \underline{\qquad} Meters$ $EPE \pm \underline{\qquad} Feet \text{ or } \pm \underline{\qquad} M$ $PDOP \underline{\qquad}$		± Feet of	1:100,000 Other						
Uses Observed: (Uses actually observed at time of site visit.)									
SwimmingWaterSkin divingWind sSCUBA divingKayakTubingBoatin	surfing Wing Ra	anoeing 'ading afting unting	Trapping Fishing Other						
Describe: (Include number of individuals recreat Recreational Use Interview when conducting int	erviews.)		uses, etc. Use Data Sheet D-						

40 Dota Sheets from Event 1

Surrounding Conditions: (Man or unusual items of interest.)		mpede recreation	al uses. Atta	ch photos of evidence	
Diamana	Industrial	State parks		No transer	
W/1.11:0	Urban	National for	ests	No trespass sign	
(Campgrounds	Nature trails			
Residential	Boating access	_ Stairs/walkw		Steep slopes	
Comments: There are and Steep slopes	e fences or on 3 of the	1 cither s 4 access p	ontso	the bridge	
Indications of Human Use: (att	ach photos)				
Roads					
- Rope swings	- RV / ATV Tra		- NPE	DES Discharge	
Dock/platform	Camping Sites		Livestock Watering		
Foot paths/prints	. Fire pit/ring		Othe	r	
- root paths/prints	Fishing Tackle	;	- 01110	1	
Comments: Now	2				
Photos (attach additional sheets if	needed)				
Upstream Photos	_				
Photo ID# Photo Purpose	Downstream Ph		Othe	r Photos	
33-6 documentation		Purpose	Photo ID#	Photo Purpose	
2 Clettimentanya	34-6 dam	nentetion	29-6	decimentation	
			30-4	11	
	- and the state of		31-6	V1	
			32-6	11	
Stream Morphology					
Upstream View's Physical Dimen Is there any water present at this vie If so, is there an obvious current?	ew? Yes No				

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)		
RIFFLE		(III)	Length (m)	Median Depth (m)	Max. Depth (m)
KUN		1.			
POOL	<u> </u>	416	15	0.5	10
					1.0

Downstream View's Physical Dimensions: Is there any water present at this view? Yes

No No

Select one of the following channel features:

RIFFLE	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RUN POOL	Ø	4.6	15	0.5	

Substrate (These values should add up to 100%.)

% Cobble 20 % Gravel	70 % Sand	10 % Silt	50% Mud/Clay	
	/0 Odild	/0 Jin	S Oro Iviud/Clay	% Bedrock

Aquatic Vegetation (Note amount of vegetation or algal growth at the assessment site) There are sparse concernent and submerged vegetation exists at this site.

Water Characteristics: (Mark all that apply.)

Algae Cover:	absent	rare	common	abund	lantdo	ominant		
Odor:							fishymusky	
Color:	l no color	light	green	dark gree	n 🖾 tan	red	green/brown	black
Bottom Deposit:	sludge	solids	fine se	ediments	none	other		
Water Surface:	clear	scum	foam	debris	sheen			

Comments: (Please attach any additional comments to this form).

D DI	~ /- /	
Investigator's Signature:	Date of Survey: $7/30/07$	
Organization:	Position: Sr. Scientist	and the second

Data Sh	eet C - Water (ts for Contact Recreation UAA Quality Data and Depth Measurements
Stream Name M	H Creek	No segment IS# Segment # West Fork Station ID_UAA-MC-
		ed at the stream access point.
	cess Point 5.18 h assessed 17,150	meters meters (stream width x 40) 150 m minimum - 500 m maximum
Field Parameters	0.000	Parameters Collected for Lab Analysis
Air Temp 28	·91 °C	(attach lab analyzed data to this form)
	7.09 °C	Ammonia-N
	<u>74</u> mg/l	Nitrate-Nitrogen
pH 7	. 85	BOD
		CBOD
	16 ppt SU.	Wother: TP, TICN
	15m	
Flow severity Flow (CFS) 4	- Mormal	
riow (CFS) 4	Or O	results to this form)
Bacterial Data Coll	ection (attach bacterial	results to this form)
Bacteria V E. Co		Other:
Protocol Used		No
Timed Average	Total time r	min at min intervals
Cross section		
Longitudinal	5 equally spaced	l samples every m (reach length//4)
Vertical	Samples collecte	d at surface, mid depth, and bottom
		d samples every m (stream width/12) d samples every m (reach length//4) d at surface, mid depth, and bottom 10 (B /9 1.454) 1.454
Stream Depth		1.4>
For purposes of trans	sect measurement, left a	and right bank orientation is determined by the investigator
facing downstream.		X
Wadaable Steeres	5 annalla a ta	
of reach.	s equally spaced trans	sects Starting at lower end or reach and ending at upper end
oj reuch.		

Ra	Stream Width (m)	Left Bank Slope	Point 1	Point 2	3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thálweg Depth	Right Bank Slope
depringh)	17ft O.S.S.M	60	0.05	1.9	2:492	2.5 1.79	2.5	2.3	2.3	2:2	19	1.4	0.9	0:56	80

Non-wadeable Streams - one transect at access point

Stream		Point	Point	Point	Doint	Deint	Point	Delint	Duint				Thalweg	Right
Width (m)	Bank Slope	1	2	3	4	SP.	6	Point 7	Point 8	Point 9	Point 10	Point 11	Depth	Bank Slope
						10 A	6101	-						

713207 Signed: Date: Organization:

Sr. Scientist Position:

	Field I	Data Sheets for Conta	ct Recreation UA	AA					
	Data Sheet B - Site Characterization								
	(must be completed for/each/site)								
	Stream Segment Number WARDER 1202K								
	Stream Segment Number	WAREZ 1202	K						
	Station ID WHA-MC-C	_ (Station ID requires submitte	al of SLOC form)						
	Date & Time: 7 30 07 1	R 11.00							
	Site Location Description (e.	g., road crossing): Mul	auk C Fm						
	Personnel (Data Collectors):	John Roman d	Valie						
	Current Weather Conditions:	Z-Partly Clandy							
	Weather Conditions for Past	Z-Partly Clandy 10 days: Rain. No ant	recedent day pe	sicd.					
			()						
	Is there a WWTP at the site? If yes, Name of Discharger		D						
	in yes, Name of Discharger_		Permit #						
	Drought Conditions: (Use Pa	lmer Drought Severity Index)							
	Extreme	Incipient Dry Spell	4 Mod	erately Wet					
(Severe	Near Normal	Very						
	Moderate	Incipient Wet Spell	Extre	emely Wet					
	J Mild	Slightly Wet							
	Site Location: X 79.0	291.79 v -91	70-1-99						
(Site Location: X Z9. 87679 Y -96. 254-99 LOCATION COORDINATES (Please Indicate coordinate system used for data collection):								
		Datum: NAD 27 or NAD 8 Datum: NAD 27 or NAD 8	3	ction).					
, Ja	State Plane	Datum: NAD 27 or NAD 83	3Zone						
lo' r	UTM D	Datum: NAD 27 or NAD 83	3 Zone						
jee do four Greens # I	HORIZONTAL COLLECTION METHOD (Indicate the method used to determine the locational data.)								
5 411	Global Positioning Sy	on METHOD (Indicate the met		e locational data.)					
De xV)	Static Mode	stem (Gr5)	Interpolation Topographic Map or D	DC					
9° x 1	Dynamic Mode (Kinematic)		Aerial Photograph or E						
C. P.N.	Precise Positioning Service		Satellite Imagery						
	Signal Averaging		Interpolation Other						
	Real Time Differential Proces	sing							
	WAASWIDE AREA / HORIZONTAL ACCURACY	Estimate System							
(GPS Data Quali		Frederice 1 - 41	D (0)					
(FOM ±Mete		Source Map Scale:	Data Quality 1:24,000					
	$EPE \pmFeet \text{ or } \pm$		Source Map Scale.	1:100,000					
	PDOP			Other					
			±Feet or ±	Meters					
	Uses Observed: (Uses actually	y observed at time of site visit.)							
				Trapping					
			Wading	Fishing					
	C		Rafting	Other					
	ruomg	boating	lunting						
	Describe: (Include number of individu	als recreating, photo-documentation of	evidence of recreational uses.	etc. Use Data Sheet D-					
	Recreational Use Interview when cond	lucting interviews.)							
		<u> </u>							

Surrounding Condition or unusual items of inter	ns: (Mark all that promote rest.)	or impede recreational uses. Atta	ach photos of evidence
City/county parks Playgrounds Wildlife Residential	Industrial Urban Campgrounds Boating access	 State parks National forests Nature trails Stairs/walkway 	 No trespass sign Fence Steep slopes Other:
Comments: Concr to walk o	ete rip-rap m and Tron	along bank in rebain protrudes	s Jangerous in places.

Indications of Human Use: (attach photos)

Roads Rope swings Dock/platform Foot paths/prints	 RV / ATV Tracks Camping Sites Fire pit/ring Fishing Tackle 	 NPDES Discharge Livestock Watering Other
and an Empty we	ility knife and (2) Ma container. There patream of the bridg	is a rope Swina

Photos (attach additional sheets if needed)

Upstream Photos	Downst	ream Photos	Other Photos		
Photo ID# Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	
28-6 documentation	27-6	decumentation	23-6	denneidation	
			24-6		
			25-6	12	
			26-6	1	

Stream Morphology

Upstream View's Physical Dimensions	S: /	
Is there any water present at this view?	Ves	No
If so, is there an obvious current?	Yes	1 No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	O	954.79M	750	1.0	70
POOL		1			di

Downstream View's Physical Dimensions:,

Is there any water present at this view?		No
If so, is there an obvious current?	Yes	No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	0	9540	1250	1.0	6.5
POOL					

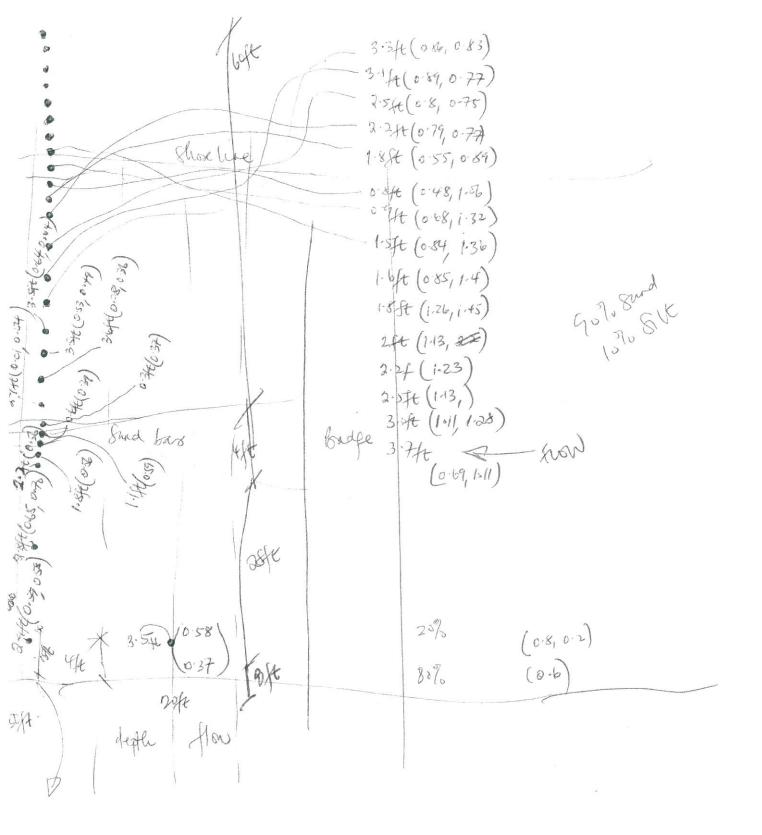
Substrate (These	e values should add	d up to 100%.)			
% Cobble	% Gravel	90 % Sand	5 % Silt	5% Mud/Clay	% Bedrock
Aquatic Vegetat	ion (Note amount	of vegetation or al	gal growth at the a		A
Algae Cover: Odor:	sludge soli	common lacrid se ght green dan ds fine sedim	wage rotton e k green tan ents none	ninant gg fishy mus red green/brov other	sky V a black
Comments: (Pleas	se attach any addit	ional comments to valge. Floa	this form). La	rge log jam es and twice	on up- gs,

	, (
Investigator's Signature:	Date of Survey: 7/30/07
Organization: PD 94.5	Position: Sr. Secenticit

	Dat						Con ty Da						onts		
Stre	am Nam	e M	MC	reel			-Segme	ent #p	Zoz	KAK	Stati	on ID	UAAJ		
	er quality														
	m Width l length c			ed H		<u>Comete</u> mete		m widt	h x 40)	150 m	minimui	m - 500	m maximun	1	
Field	Param	eters		NO	0 430	Para	meters								
	emp r Temp	ZT	7.72°	С		JAn	h-lab an S/V 99 monia-	N	data to	this for					
DO pH		67	.56 m 85	ng/l		⊔ Nit ⊔ BO	rate-Nit D	rogen					1 ded	~	
Salin	luctivity ity ni Depth	0.	$\frac{9}{23}$ p 40 m	pt		Oth	OD her: TF	,TKI	U	_	CA	ngen	stern of	served and)
Flow	severity (CFS)	-	5-Nor								80	digen	Strafe C	sole have	
Bacte	erial Dat	ta Colle	ection (attach b Enteroco	acterial	l results	to this t	form)				L.			
Proto	<i>col Used</i> ned Ave	d							1.						
Cre	oss sectio	on	1	l equall	y space	d samp	n les ever	У	m	(stream	ı width/	12)			
Ve	ngitudina rtical	al	5	equally	/ spaced	d sample	es every rface, m	/	m ((reach le	ength//4) (A	totally at	- Fingle	1
					concete		20			2A_	0	sft	coopsie in	allert p	it
	m Deptl urposes of		ect mea	sureme	nt, left a	and righ	t bank o	orientat	ion is d	etermin	ed by th	ne inves	tigator	40N = 08	s7fefs
facing	g downst	ream.				U							-Butor	How = 0.8 Jel.	3.495
Wade	able Str	eams –	5 equal	ly space	ed trans	sects Sta	arting a	t lower	end or	reach a	ind end	ing at u	pper end	2 0.8	ifes
of rea Stream	Left										Τ		Thalweg	Right	5 2
Width (m)	Bank Slope	Point	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Depth	Bank	
(111)	Slope						R.				10	11		Slope	
						H	a								
						\$16	104								
1	Von-W	adea	ste	upst	ean	of	Endpe	- w	ease	sene	nts .	take	doms	beam	
	vadeable					V)				shee		0 0 1 1 0		
Stream	Left												Thalweg	Right	
Width (m)	Bank Slope	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Depth	Bank Slope	
00	75													85	
Please	verify tl ete.	nat you	have co	ompleted	d all sec	ctions, c	hecked	all app	icable l	boxes a	nd that e	everythi	ing is		
Signed	l: Date:	HA &	B	d	-7	130	107			`					
Oran	zation	PB	SA.	^)				Positic	n:	Sr. 1	Seiter	the	t		

Contact Recreation UAA Draft Protocol

- Statement



meaning 2 st

	Field	Data Sheets for C			A
		Data Sheet B - Site		tion	
			ted for each site)		
	Stream Segment Name	Mill Creek	East Ban	K	
	Stream Segment Number	AAA MCSEL N	O segment	ID #	
	Station ID UAAT	(Station TD requires su	ibmittal of SLOC f	orm)	
λ.	Date & Time: 7/70/07 Site Location Description (Personnel (Data Collectors) Current Weather Condition Weather Conditions for Pass Is there a WWTP at the site	e.g., road crossing): <u>Uc</u>): <u>John Branan</u> s: <u>Z-Partly Ch</u> st 10 days: <u>Rain</u> No	; Kofi Sam		od <
	If yes, Name of Discharge	r	Pe	ermit #	
(Drought Conditions: (Use F E Extreme E Severe Moderate Mild	Palmer Drought Severity In Incipient Dry Near Normal Incipient We Slightly Wet	y Spell I et Spell	_ Very	erately Wet Wet mely Wet
Sheets from the trent at 1	Site Location: X_30_ LOCATION COORDINAT Latitude Longitude State Plane UTM HORIZONTAL COLLECT Global Positioning S Static Mode	TES (Please Indicate coordi Datum: NAD 27 or N Datum: NAD 27 or N Datum: NAD 27 or N TION METHOD (Indicate t	inate system used for IAD 83 IAD 83 Z IAD 83 Z the method used to Int	or data collec Cone Cone determine the cerpolation	e locational data.)
19.1)	Dynamic Mode (Kinematic)			nic Map or D	
chee 1 dr y	Precise Positioning Service		Satellite In	tograph or D	
7° N	Signal Averaging		Interpolati		
Type /	Real Time Differential Proc	essing	merpolati	Shi Other	
<u> </u>	00		;te		
	HORIZONTAL ACCURAC				
1	GPS Data Qua		Ir	terpolation	Data Quality
	$FOM \pm \underline{Me}$ EPE \pm Feet or \pm	eters	Source Ma	p Scale:	1:24,000
	PDOP	Meters			1:100,000
			±	_Feet or ±	Other Meters
					IVICICIS
	Uses Observed: (Uses actua	ally observed at time of site	visit.)		
	Swimming	Water skiing	Canoeing		Trapping
	Skin diving	Wind surfing	Wading		Fishing
	SCUBA diving	Kayaking	Rafting		Other
	Tubing	Boating	Hunting		
	Describe: (Include number of indivi Recreational Use Interview when co	duals recreating, photo-document	tation of evidence of rec		te. Use Data Sheet D-
		,	54 Jul		

Wildlife	Campgrounds	National fores	ts - Fenee Steep slopes
Residential	Boating access	_ Stairs/walkwa	
Comments: At this si and fereing wh Visit the water Indications of Human Use:	Tevel and flow	creationalu	ess and has guard 19its se. During this site igh for contact pecreation
Roads	RV / ATV T	racks	NPDES Discharge
Rope swings	Camping Site	es	Livestock Watering
Dock/platform	Fire pit/ring		Other
☐ Foot paths/prints	Fishing Tack	le	
Comments:O			
Upstream Photos	Downstream	Photos	Other Photos
Photo ID# Photo Purpose		to Purpose	Photo ID# Photo Purpose
38-6 documentat	ien 39-6 do	amontation-	35-6 documentation
		÷.	366 11
			37-6 1
			40-6 11
Stream Morphology			

Upstream View's Physical Dimensions:

Is there any water present at this view?	Yes	No
If so, is there an obvious current?	Yes	No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	0	16.15	40m	1.5	7.7-
POOL				1.3	

Downstream View's Physical Dimensions:

Is there any water present at this view?	1	No
If so, is there an obvious current?	Yes	No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN	0	16.0	som	1.5	70
POOL				10	60

Surrounding Conditions: (Mark all that promo	te or impede recreational uses. Attach	photos of evidence
or unusual items of interest.)	-	1

- City/county parks
- Industrial

_ State parks

No trespass sign

1

Substrate (These va	alues should add up	to 100%.) NA	Could	I not determ;	ne. Seconments
% Cobble	% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock

Aquatic Vegetation (Note amount of vegetation or algal growth at the assessment site)

. 1 A	 6	
 NA		

Water Characteristics: (Mark all that apply.)

Algae Cover:	absent	rare	common abundant dominant	
Odor:	hone	oil	acrid sewage rotton egg fishy musky	
Color:	no color	light	ht green dark green dan red green brown	black
Bottom Deposit:	_ sludge	solids	s fine sediments none other	oracit
Water Surface:			foam debris sheen	

Comments: (Please attach any additional comments to this form).	Flow too high	to access
from the bankor stream.		

	/ /
Investigator's Signature:	Date of Survey: 7/30/07
Organization:	Position: S. Sevent. st

Field Data Sheets for Contact Recreation UAA
Data Sheet C - Water Quality Data and Depth Measurements
Data Sheet C - Water Quality Data and Depth Measurements No segment IS# Stream Name Mill Cree R Stream Name Mill Cree R Segment # Cost For K Station ID CIAA-MC-04
Weter quality data and mode a line line of a line of the

Water quality data only needs to be collected at the stream access point.

 Stream Width at Access Point
 16-15

 Total length of reach assessed
 9.00

 meters (stream width x 40) 150 m minimum - 500 m maximum

Field Parameters

Air Temp $\boxed{28.08}^{\circ}$ CWater Temp $\boxed{27.59}^{\circ}$ ° CDO $\underbrace{5.42}_{\circ}$ mg/lpH $\boxed{7.69}_{\circ}$ CConductivity $\underbrace{0.731}_{\circ}$ mS/lSalinity $\underbrace{0.16}_{\circ}$ pptSecchi Depth $\underbrace{0.15m}_{\circ}$ Flow severity $\underbrace{5.165}_{\circ}$ Flow (CFS) $\underbrace{143.19}_{\circ}$

Parameters Collected for Lab Analysis (attach lab analyzed data to this form) TSS Ammonia-N Nitrate-Nitrogen BOD CBOD Other: <u>IP</u>, TKN

Bacterial Data Collect	ion (attach bacterial results to this form)
Bacteria E. Coli	Enterococcus Other:
Protocol Used	
Timed Average	Total timemin atmin intervals
□ Cross section	11 equally spaced samples every m (stream width/12)
Longitudinal	5 equally spaced samples every m (reach length//4)
Vertical	Samples collected at surface, mid depth, and bottom

Stream Depth

For purposes of transect measurement, left and right bank orientation is determined by the investigator facing downstream.

Wadeable Streams – 5 equally	spaced transects Starting	at lower end or reach an	nd ending at upper end
of reach.			S

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope	
16.15	90	0.4	0.4	0.4	0.4-	0.4	0-4	0.4-	0.4-	0.4	0.4	0.4	0.4	90	7/3010
															71300

Non-wadeable Streams - one transect at access point

Stream Width (m)	Left Bank Slope	Point 1	Point 2	Point 3	Point 4	Paint	Point	Point 7	Point 8	Point 9	Point 10	Point 11	Thalweg Depth	Right Bank Slope
						~ ~	plen	P P						

Signed: Date: 13/07	
Organization. PBS45	

___ Position: Sr Scientist

Appendix H

PBS&J Field Data Sheets



PE	BS&J
Mill Creek Contac	t Recreation Pilot Study
	Data Sheet
	WS-b/18/07
a = a = a = a = a	
Sample ID: UAAMC-01-1 Segmer	
Station ID: UAA 1 Location	1: West Fork MillCreek@ Bluehde/Industry R
Date: 6/13/07	Names: Marisa Weber '
Time: 1403	Kef: Sam
Present Weather: 2	Pavitra Rammahan
Wind Intensity:	<u> </u>
Days since last significant rainfall (Days): \ 🖸	Signature: Man Mal
Quantity of Rain (in.): 0, 87	
Site Ch	aracteristics
Physical Characteristics	
Stream Width (m): O. 6	
Stream Depth (m): 0, 2	
Substrate: Sand/Gravel composite	
Flow (cfs): 0.0395	
Data Source for Flow: Computed by train	need method
Observational Data	
Water Odor: O-None Water Color: - Norme	Sheen: vone
	Floatables: janvez
	Deposits: Sand
Flow Description: Glide	Debris in Water: Lay Jamb
Flow Severity: 3 -Normal	Shoreline: <roded; fip="" mp<="" td=""></roded;>
Other observational data:	
Flow method: computed by trans	cent as allered in the MA - I MA Pierre H want
Bological Activity: None	sect moting using Marsh/McBirney Flow and
Instram Activity: None	
Water Quality Parameters Recorded (Discrete Sa	ampling)
Temperature (°C): 7.7.39	Sample Depth (m): 0, C
Sp. Conductivity (μ S/cm): 0.673	Data Logger: USI 600 XLM
Dissolved Oxygen (mg/L): 10 89	Secchi Depth (m): 0, 21
pH (s.u.): 7. 89	Sample Time: 1540
Additional Comments: Salinity 0.32551	
Photo Log	
Pic No.	Description
13 View of Bridge at mill Co	reek and Industry Rd. facing North.
	Seekand Industry Rd. facing South
15 View of Mill Creek face	ing west.
16 View of will Creek for	
17 View of North east banc	of Mill Creek
18 Newsf Southeast banc	of mill Creek
19 View of North west ba	ne of Mill Creek
20 Up w of Southwest bar	

	PBS&J					
	Mill Creek Contact Recreation Pilot Study Field Data Sheet					
Sample ID: UA Station ID: UA Date: Ca//3/4	Ime-Z Loca	ation: Mill Creek @ FM 2429 Names: John Branger				
Time: 11.58 Present Weather:	· · · · · · · · · · · · · · · · · · ·	Jesse Moya				
Wind Intensity: Ca	alm-1	0 PPI				
Days since last sig	gnificant rainfall (Days): 10 in.): 0、タフ	Signature:				
Gedanity of Hairi ($\frac{1}{2} \sqrt{2} \frac{1}{2} \frac{1}{2} \sqrt{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \sqrt{2} \frac{1}{2} \frac{1}{$	\bigcirc				
	Site	Characteristics				
Physical Charact Stream Width (m)	teristics :					
Stream Depth (m)	: 2.5Ft 0.76m					
Substrate: Con	d					
Flow (cfs): 22.2	7	······				
Data Source for F	low: Calculated by tra	need methodusing March/McBirney FlowInAte				
UDServational Da	<u>118</u>					
Water Odor: 10		Sheen: Nove				
Water Color: 3 Water Clarity: 2	- greenish	Floatables: 1_eaves				
Water Surface:		Deposits: Nowe				
Flow Description:		Debris in Water: Log jam Shoreline: Sand / Concrete R+D RD				
	L-low	Shorem 12 fand / Lowerer 12 fag				
Other observation						
	s - Transect w/marshi	n. Russel Star + a				
Sample Dec	the IEI	Binny Flowman P				
	Schultes-Fish, L	oldenshiner, 19al				
	activities = 3 peopl					
Water Quality Pa	rameters Recorded (Discret	e Sampling)				
Temperature (^e C):	29.54	Sample Depth (m): 1 Ff. =0.3 m				
Sp. Conductivity (µ	1S/cm): 0.567	Data Logger: YSI 600 XLM				
Dissolved Oxygen	(mg/L): ア,フモ	Secchi Depth (m): $1.5FT = 0.46$ m				
pH (s.u.):	7.66	Sample Time: 12:45				
Additional Comme	nts:	Salinity - Cils				
Photo Log	Photo Log					
Pic No.	· · · · · · · · · · · · · · · · · · ·	Description				
	View of South wes					
à	View of Creek Fain					
7	View of creek facini					
5	View of Crever Language	East.				
10		pan C.				
-1	View of Northcoast	Banc				
	Vitue FFM ZAZ	9 Farma Borth				
Q						

		PBS&J				
	Mill Creek	Contact Recreation Pilot Study				
		Field Data Sheet				
Sample ID: UA	AMC-01-4	Segment: No Segment ID-#				
Station ID: MAIL	1 Greek UAAA					
	13,2007	Location: East Fork Mill Creek & Ucckert Rd. Names: Huilton Rommahan				
Time: 12:05	13, 2007	april 1944				
Present Weathe	r: 2: Partly Cloud	Marisa Mober				
Wind Intensity:	1 Calm	Koti Sam				
	ignificant rainfall (Days):	10 Signature:				
Quantity of Rain		W WANK // M				
		Site Characteristics				
Physical Charac						
Stream Width (m						
Stream Depth (m	1): 0.53					
Substrate: Sa	nd/Gravel Com	posite				
Flow (cfs): ス	.12	,				
Data Source for I		zy transect methed				
Observational D	<u>ata</u>					
Water Odor:	Heways	Sheen: None				
Water Color:	- prownish	Floatables: None				
Water Clarity: 7	- secchi	Deposits: None				
Water Surface: Flow Description:		Debris in Water: None				
Flow Severity: 3		Shoreline: Sand bar				
Other observation	nal data: t1.	Turbidity: Z				
McBirney F	Ta male	calculated by transactime that using a Mursh-				
	ivity included : Cat	HA Earsts Poly county burn to				
	diveres: None	the Egrets, fish, agentic insects.				
Water Quality Pa	arameters Recorded (D	screte Sampling)				
Temperature (°C)	: 27.07	Sample Depth (m): 0, 2				
Sp. Conductivity (µS/cm): 0.734	Data Logger: VST 600 XLM				
	Dissolved Oxygen (mg/L): 6.07 Secchi Depth (m): 0.53					
pH (s.u.): 구,	81	Sample Time: 1620				
Additional Comm	Additional Comments: Salinity - 0.36 S.S.U.					
Photo Log						
Pic No.		Description				
Jeb +3- 21	View of Bridge la	DMill Creek and Welkert Nd facing North				
22	Niew of Bridge @	MillCreekand Verkert Rd. tacing South				
23	Niew of Eastfork	Mill Creek facing west.				
- 24		KMill Creek facting East.				
Z5	View of North is	est banc mill Creek,				
26	View of Souther	est bank mill Crexil				
27		est bane mill creek				
<u> </u>	Niewot' South A	ast bane mill Creek.				

	PB:	S&J	
	Mill Creek Contact F	Recreation Pilot Study	
	Field D	ata Sheet	
Sample ID:	A	Vosegment ID# Nost Jork Mill C	
Station ID: VAA -	Segment: V		
Date: 06/22			adustry Rd/
			mmilan)
Present Weather:	P.M Dudy 32°C (89	Koj-San	n, Jesse mut
	Calm 32°C (89	F) Jenen	0 0 00
Days since last significa	ant rainfall (Davs):		
	1-93	Signature: Pavit.	va Rammot
	Site Chara	acteristics	
Physical Characteristi			
Stream Width (m): 8	766		
Stream Depth (m): 0	35		
Substrate: Grand	Sand, malel	e V .	
Flow (cfs): 10 · 19			
Data Source for Flow: (bl Collated bas	ed on instantance	ous depte &
Observational Data Water Odor:/-/\ 0	<i>₽</i>		
Water Color: Gag AF	A0	Sheen: Nove	(T)C
	Wolks www.	Floatables: None	
	Secchi Depthis Ave	lable Deposits: Fine	Sed ments
low Description: Ru		Debris in Water: No	~\$
low Severity: 3 - h		Shoreline: Shore cha	y/vegetative
Other observational data:	··· I · I · I · I · I · I · I · I · I ·		1
latan Quella D			,
aler Quality Paramete	rs Recorded (Discrete Sampli		
emperature (°C):	6.01		35
ssolved Oxygen (mg/L):	10321 321	Data Logger: YS I	DOOXLM
1 (s.u.): 7-60	<u> </u>	Secchi Depth (m): V .3	(martego)
ditional Comments:		Sample Time: 1235	
			ŧ
noto Log			
Pic No.		Description	
9006443 9t-	eam Run lac		
	ream Run G	ma downstream	
	- Rual Ca	- J Loft Bourk.	
		<u> </u>	

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	PBS&J
	Mill Creek Contact Recreation Pilot Study
	Field Data Sheet
	Sample ID: Segment: Man Stern Mill Cret
	Station ID: UAN-MC-2 Location: Intersection of Mc & FM2420
	Date: 06128107 (in and in 1 103201 or of the fringer
	Time: 14 20 Ivanies. D. Ida Ramachan
	Present Weather: Ola 1 Concerning Kol-Sam, Jesse Mon
0	Wind Intensity: 1, Calm
ſ	Days since last significant rainfall (Days):
ſ	Quantity of Rain (in.): 1-93 m
ſ	
	Site Characteristics
	Physical Characteristics
	Stream Width (m): 67096 Not Mess used due to inaccessibility to
	Stream Depth (m): Not Marsured 10
_	Substrate: Sand, S:lt and Mud Clay
	low (cfs): NA
	Data Source for Flow: Un-blo to Calcolte due to in-degua
	Juser Valional Data
	Sheen: Nittod
	Vater Color: 14-987 Brown Floatables: None Floatables: None
ĥ	Valer Charley IVA - Secch depth shall Deposits: Fine Sed-ments
F	Depris in Water. No and
	Shoreline: Noder a Feat (OW) Shoreline:
	ther observational data: O O Ericted
Ĕ	Stand of Cass the contige
7	
-	installing was and forthe log taking
	anstantaneous depth & velocity measurements
w	ater Quality Parameters Recorded (Discrete Sampling)
Τe	
Sr	D. Conductivity (uS/cm): Q.C.R. Sample Depth (m): (Not
Di	
ρН	(s.u.): 7,79
٩d	ditional Comments:
8	5 Son Par College I to the test of the second
Ph	oto log
	Dia Na 2 (cu) K gett
20	SCOGHIST OKANNER de mai
	in and have a star and have and have a
~~	SCO6486 Streem Run,
2	
<u> </u>	
<u> </u>	
2 	

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		PBS8		
	Mill Cre	eek Contact Recre	ation Pilot Study	
		Field Data SI	heat	
		1)0 se	ment ID # MUC Cree	
Sample ID:		Segment East	f mill cree	K
Station ID: UA	$\Lambda - Mc - H$	Location: The	ersection OFE	-at mc & De
Date: 0012	2107	Loodion. 20 ml		
Time: 1330			Names: Part-	x-Rammoha
Present Weather:		39°F (80°C)	koj Sam,	Jesse Moya,
Wind Intensity: \	- Calm	21 16)	· · · · · · · · · · · · · · · · · · ·	m.
	gnificant rainfall (Days	/s): 2	Signatures D	p
Quantity of Rain (in.): 1-93		Signature: Pow	tra-Rammohan
		Site Character	istics	
Physical Charact				
Stream Width (m):				1
Stream Depth (m)				
	md, mudg	1 den		
Flow (cfs): 02				
Data Source for Fl		ated base	tem no h	
Observational Da			<u>q</u>	velocity me
Water Odor: 6-7			Sheen: Nore	corry mee
	get green	<u> </u>	Floatables: Nor	10
Water Clarity:		pth as available		2 Sed ments
Water Surface:		\	Debris in Water:	one
Flow Severity: 3	Rum/Glidge		Shoreline:	2 gamlelay
Other observationa	- Normal			
Dizard	A			
<u>A contra</u>	, oard wa	re/fence		
Vater Quality Para	meters Recorded (D	Discrete Sampling)		
emperature (*C):	26-48	(P	Sample Death (m)	1.0
p. Conductivity (µS	S/cm): 316	5		1.48
issolved Oxygen (r	ng/L): 5.29		Data Logger: YSI	600 XLM
H(s.u.): '¬Ţ ,	66		Secchi Depth (m): 0 - Sample Time: 13 5	3
dditional Comment	S:		Sample Line: 135	5
noto Log				
Pic No.		Desc	ription	
9006449	upstream			
09006451	Hounstre	m View	0 1 1 0	
30064571	Upstream	- Real -	2 banks	
30 06 458	upstream		ank	
	- yan an	helt B	ark,	
	1			

	PBS&J	
	Mill Creek Contact Recreation Pilot Study Field Data Sheet	
900th -South East	Sample ID: $03-04$ Segment: Main Stem 1202KStation ID: 04 Location: $M:11$ (rekDate: $6.191,077$ Names: KCH $5-Marshall$ Time: $10:36$ Present Weather: $AC = C = C + 29-31$ °C, Prefly $C = 0004$ yWind Intensity: $SSE = S-10$ MPHSignature: $AC = C = Marshall$ Days since last significant rainfall (Days): $S = S = S = Marshall$ Quantity of Rain (in.): $O, 4$	
	Site Characteristics	
Þ	Physical Characteristics Stream Width (m): 33 Stream Depth (m): 7 Substrate: Sand Flow (cfs): 1 H H - 8 Data Source for Flow: MFH Carled be sed on instantian Observational Data Water Odor: A Dive Sheen: None Water Color: I- RR D com Water Color: I- RR D com Water Color: I- RR D com Water Clarity: Por Sesch: Water Surface: 2 Prepto Flow Description: Modeat R - How Flow Description: Modeat R - How Flow Severity: 3 - Nofmal 7 Hoodyns Other observational data:	neerus Troscus - Trentis
	Water Quality Parameters Recorded (Discrete Sampling) Temperature (°C): 16.35 Sp. Conductivity (µS/cm): 0.386 Dissolved Oxygen (mg/L): 6.38 (74.69) Dissolved Oxygen (mg/L): 6.38 (74.69) Photo Log Photo Log Pic No. TMG 086 Shawmen Up at memory band of conserve - 0825 Marker Or Shawmen John John John John John John John Joh	

	PBS&J
Mill Creek	Contact Recreation Pilot Study
	Field Data Sheet
Sample ID: MC-1	Segment: No segment Ib #
Station ID: Site 1	
Date: $Oo/28/07$	Location: Blue hole and Industry Kd.
Time: 17:40	Names: John Branom, J. MEyo
Present Weather: 1-clear, 92°F	J. Schlitzkes, P. Rammod
Wind Intensity: 1-Calm	Muleber
Days since last significant rainfall (Days):	7
Quantity of Rain (in.): 0.35	Z Signature:
	<i>U</i>
e e e e e e e e e e e e e e e e e e e	Site Characteristics
Physical Characteristics	-
	6m
	om
Substrate: Clay/Sand/Ground	
Flow (cfs): 3.76	
Data Source for Flow: Calculated	
Observational Data	
Water Odor: 6- pone	Sheen: Norrel
Water Color: 1-brownish	Floatables: Leaves
Water Clarity: NA Secchi	Deposits: Samel
Water Surface: 1-61-	Debris in Water: Branches
Flow Description: run/Clide	Shoreline: Critical Clay/vegetal
Flow Severity: 3-normal	
Other observational data: fants an	& branches in the stream that obstruct
TIDO, WE TOOK + ION MEA	surements up stream of theseat ~ 5mp
from the bridge	
V	
Water Quality Parameters Recorded (Dis	crete Sampling)
Temperature (°C): Z7.69	Sample Depth (m): 0.40
Sp. Conductivity (µS/cm): 493	Data Law Law Law
Dissolved Oxygen (mg/L): 5.94	Data Logger: 451 600 XLm Secchi Depth (m): > 0. 4 (c
DH (s.u.): 7.75	Sample Time: 13:00
Additional Comments:	Salmity-0.23
Additional Comments:	
Additional Comments: Photo Log Pic No.	Salmity -0.23
Additional Comments: Photo Log Pic No. $Ob \in 39(-39) \longrightarrow Showing +$	Solve it $y = 0.73$ Description
Additional Comments: Photo Log Pic No. $Ob \in 39 \longrightarrow Showing +$	Description Le Updram & dstram UST.
Additional Comments: Photo Log Pic No. $Ob \leq 3 \leq -39 \rightarrow \leq Rowing + 1$ $a \leq 5 \leq 4 \leq -39 \leq Showing + 1$	Description Description Description Description Description Description Description Description
Additional Comments: Photo Log Pic No. $Ob \in 39 \longrightarrow Showing +$ $o \in 541 \longrightarrow Showing +$ $o \in 541 \longrightarrow Showing +$	Description Descr
Additional Comments: Photo Log Pic No. Db < 39 - 39 - > Showing t 06 541 - Showing t 6542-43 - Showing Se	Description Descr
Additional Comments: Photo Log Pic No. DD < 39 - 39 - > Showing t 06 5 4 1 - > Showing t 06 5 4 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 -	Description Description Le Updram & detram dete Updram Of byte grossip stream of byte grossip
Additional Comments: Photo Log Pic No. Db < 39 - 39 - > Showing t 06 541 - Showing t 6542-43 - Showing Se	Description Descr

	PBS&J	7
	Mill Crook Context Describer Differentia	
	Mill Creek Contact Recreation Pilot Study	
	Field Data Sheet	
	Sample ID: Segment: 500 Jon DMC	
	Sample ID: Segment: Letest Jonn b) MC	
	Station ID: UAA _ LA Location: Intersection of East jork Mc &	Uckes
	Date: 06/20107 Names: The TR PR	RI
	Time: 1\30	-
	Present Weather: Cloudy	-
	Wind Intensity: 1- C-lm	4
	Days since last significant rainfall (Days): O Signature: Part -Ram with	2
	Quantity of Rain (in.): 0-141	
	Site Characteristics	
	Physical Characteristics	
	Stream Width (m): 4.5	
	Stream Depth (m): 0-825	
	Substrate: Sand, SELF, Mud com, Sedments on the	1.10
		haff
	Data Source for Flow: Clc water from instantancous mesurements	Rock
	Observational Data	boil
	Water Odor: Nove	
	Water Color: L-ght Brown Floatables: Night	
	Water Clarity: No Deposits: Set - a and S and A	198.
	Water Surface: Debris in Water: Debris of Lothorn	b i i j
	Flow Description: Run Shoreline: Shoreline:	bank
<i>(</i> *	Flow Sevency: 3 - 1 Vonm -	
	Other observational data:	
	OBserved Rents Shrubs benett the water	
	Swjace the branches Causing eddies.	
	Water Quality Parameters Recorded (Discrete Sampling)	
	Sp. Conductivity (uS(cm): 1, 7 Cr. Standard	
	Dissolved Oxygen (mail): E C II	
	Additional Comments: Sample Time: 306	
	Photo Log	
	Pic No. Description	
\mathcal{C}	Description	
{	The course of the the the the the the the	
_		
ς	DSCORSOG DESCES Morting Upstream	
2		. 01 1
	-DSCODS 46 Showing Optimizing four of Sed ments on help of	ght bar
	DS CO6597 7 Showing reld Circus to King me - Swerrend	
	-DSCO6612 9 Collection Samples	\mathcal{P}
	-DSCOGE12 19 Collecting Samples at Transec-1	
	(wolt of the bidge crossmodule	
	to addres caused by aquetic plan	NS1
	· · · ·	

	PBS&J
Mill Cre	eek Contact Recreation Pilot Study
	Field Data Sheet
Sample ID:	Segment: NO Segment ID#
Station ID: UAA-1	Location: West Forth mill Creekat Industry
Date: 7/11/07	Names: John Branom
Time: $4 - 00$ Present Weather: 2, P_{c}	Jesse Maya
	8
Days since last significant rainfall (Day	(a) = (a + b) + (a + b)
Quantity of Rain (in.):	ys): (Signature: Signature:
	Site Characteristics
Physical Characteristics	
Stream Width (m): 3.9	
Stream Depth (m): 0.76	
Substrate: Clay/sand	
Data Source for Flow: Calculate	1
Observational Data	$\mathcal{V}_{$
Water Odor: 6, None	Observe a base of
Water Color: 1, brownish	Sheen: None
Water Clarity: NA	Floatables: None Deposits: 3and
Water Surface: I-Calm	Deposits: <u>Sand</u> Debris in Water: Non C
Flow Description: Run	Charolina
Flow Severity: 3 Macmal	- Se to My - Standa
Other observational data: Debcis	that were previously on the banc have been
washed downstream	
Water Quality Parameters Recorded	(Discrete Sempling)
Temperature (°C): Z& Z3	
Sp. Conductivity (µS/cm): 520	Data Logger: YSI 6920 VZ
Dissolved Oxygen (mg/L): 6.18	Secchi Depth (m): 0, 40
pH (s.u.): 7.84	Sample Time: 14:00
Additional Comments:	
Photo Log	
Pic No.	Description
	imple collection Area
(1) Upstacam Fl	ow + depth measurements collected
1(2) Upstream	
1(3) Upstream	
(4) Downsteer	
1(5) Pown steern 1(6) Pown steern	
1(6) Downstream	

	PBS&J
	Mill Creek Contact Recreation Pilot Study
	Field Data Sheet
	AAOOZ Segment: 1202K Location: Mill Creek at FM 2429 Names: John Brance
Sample ID:	Segment: 120214
Station ID: U	AAGOZ Location: Mill Greek at FM 2429
Date: HUC	Names: John Brange
<u>11110. 11.17</u>	Teser Maya
Present Weathe	
Wind Intensity:	Z sloght a pm
Quantity of Rain	significant rainfall (Days): 5 Signature:
Juanity of hain	(in.): 0.54
	Site Characteristics
Physical Chara	
<u>Stream Width (n</u> Stream Depth (n	
Substrate: /	
	G.13
	Flow: Calculated
Observational [
Nater Odor:	Sheen: NOVE
Vater Color:	Brown Floatables: 100005 (Twigs
Vater Clarity:	Seechi Deposits: Sand
Nater Surface:	I-Calm Debris in Water: / Pris
-low Description	
-low Severity:	3-Normal
Other observatio	THE THE THE CALLS WELL CHAMPED OF
the site	. Two carcages were ano the southwest bring and one
was on	a log jam at the bridge on the upstream side.
	,
Vater Quality P	arameters Recorded (Discrete Sampling)
emperature (°C	arameters Recorded (Discrete Sampling) : て名・フレ Sample Depth (m): 0・3
	(µS/cm): 492 Data Logger: YSI 6000 VZ
issolved Oxyger	n (mg/L): 5.55 Secchi Depth (m): 0.41
H (s.u.): 7,	88 Sample Time: 1115
dditional Comm	ents:
hoto Log	
Pic No.	Description
0)-1(2)	Obstruction upsteern side of bridge
1(3)	Area Sanples collected + Flow measurements taken
1 (4)-1(5)	Debris with hos Romains on avoid.
(6)-1(3)	Upstream South side of Creek Next to pridse
(a) - 1(17)	Downstream different pictures
168)	Upstream View

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РВ	S&J
Mill Creek Contact	Recreation Pilot Study
	Data Sheet
	NO segment ID#
Sample ID: Segment:	East Fork MillCrack
Station ID: UAP-4 Location:	Mill Creek and Euckert. Rd.
Date: 7/11/07	Names: John Branom
Time: 15:15	Jesce Moya
Present Weather: 2 P.C.	
Wind Intensity: 1, Calm 32.459	
Days since last significant rainfall (Days):	Signature:
Quantity of Rain (in.): D. 54	
	racteristics
Physical Characteristics	
Stream Width (m): 4.57	
Stream Depth (m): 0,48	
Substrate: Clay/Sand	
Flow (cfs): 10,58 Data Source for Flow: Calculated	
Data Source for Flow: Calculated	
Water Odor: 6, None	
Water Color: 1, Brownish	Sheen: None
Water Clarity: 2, 30 d	Floatables: None
Water Surface: 1, Calm	Deposits: Sand Debris in Water: Dome
Flow Description:	
Flow Severity: 3 vormal	Shoreline: errod gd Sand/clay
Other abase with a line is	Creek perpendicular to stream
flow at the bridge on the n	<u>pstream</u> side.
Water Quality Parameters Recorded (Discrete Sam	pling
Temperature (°C): 28,26	Sample Depth (m): 0,48
Sp. Conductivity (µS/cm): 608	
Dissolved Oxygen (mg/L): 5, 50	Data Logger: VST 6970 VZ Secchi Depth (m):0,5 3
pH (s.u.): 7.84	Sample Time: 15:15
Additional Comments:	
Photo Log	
Pic No.	Description
Upstream Northside of creek	
1 (1) Upsteen middle of Cheek NE	xt to blidge (obstruction)
[2] Westkern Southside of Cheek	Next to bailee
-1(3) Upstleam	
1(4) Upstream Sample collection +	Flow newsuring AREA
-1(5) Downstackin Southside of C	Reck (Next to bendge)
[16] Down green North side of	Check (NEXT to bridge)
1(7) Down stream	

	DDOC -
	PBS&J
Mill	Creek Contact Recreation Pilot Study
	Field Data Sheet
Sample ID: UAA1-5	No segment IS # Segment: West Fork Mill Creek
Station ID: UAAI-5	Segment: West FORK MI Creek
Date: 07.24-07	Location: Mill Creek at Industry of Blue hol
Time: 11:17	Names: (of Ban
Present Weather: Bartly Clarky	y John Bronom
wind intensity: Falm J	- Vyer Schitzkus
Days since last significant rainfall (I	
Quantity of Rain (in.):	U.St The state
942 El 7 16	67
Q.	Site Characteristics
Physical Characteristics	
Stream Width (m): 15' ~ V	4672
Stream Depth (m): 2'4* = 28	4.572
Substrate: jit of gland	3,7/12m
FIOW (CIS): 28.510	
Data Source for Flow: Coloubte	d using Soutek handhold fl
Observational Data	a using souter handheld flow meter.
Water Odor: 6-none	
Water Color: 1-greenish brown	
Water Clarity: Secch	Deposits: card
	4
	le Debris in Water: funges Shoreline: Constant Conferences
Flow Severity: <u>3-Norma</u> Other observational data:	So a conversion
Note: 0 III -	
Vater Quality Parameters Recorded	d (Discrete Sampling)
Simperature (-C). Clo.44	Sample David ()
line al line i o	Data Logger: VST (add VI m
	Secchi Depth (m): D. 61
dditional Comments:	Sample Time: 11:17
hoto Log	
Pic No.	Deve hit
1-5 Niews Fri	Description
3-5 View of Nor	theast bank, downstramside of bridge.
	provest tank upstream certa (1 and
La ser ly sour	mwest bank, upstream side of hards
7 - F Lilling Martin	The stank down stopped and i she
255 Hiewof Mille	reek foring down stream.

				5	6	7	8	9	10	A.	12 depth 1.;
1.06	1.04	9,99	0,99	1.01	0,94	0,91	1.02	0.95	0.99	3.88	0.92
12:30	12:35	12:40	12:45	12:50	17:55	13:00	13:05	13:10	3:15	17:20	13:25
A	B	1	0	apE	' F	6	'H	I	\mathcal{T}	K	
	-										

Britena / Flow

		PBS&	J	
	Mill Creek	Contact Recrea	tion Pilot Study	
		Field Data Sh	act	
			661	
Sample ID: UA		Segment: bra	mFork 120	JZK
Station ID: () A		Location: MAin	Fork Will Co	OCK FM-2429
Date: 7/25/c Time: 11:00 a	·		Names: John	Rout FM-2429
Present Weather:			DUPA	Schlis Yue
Wind Intensity:	- Calm			
Days since last sig	nificant rainfall (Days):	3	Signature;	Rf
Quantity of Rain (i	n.): 0720 0.7	37	Orginature,	0-5-
	255/07			
	A S	Site Characteris	stics	
Physical Characte				
Stream Width (m):				
Stream Depth (m): Substrate:				
low (cfs): 99	-d/Silf/Clay			
ata Source for Flo	TB W. Color 11-A			
bservational Dat	a Colouted	Eine Soutel	- hand held fl	owineter-
/ater Odor: 10 -	- None			
/ater Color: j-	Brown		Sheen: nome	
ater Clarity: N	1 Al Seachi		Floatables: Lea	veg
ater Surface: 1-	Calm		Deposits: Same Debris in Water: 7	0/9117
ow Description:	Kur/Glode		Shoreline: Erode	g jahr at bruke
ow Severity: 3	-Normal		Choremile. Era	a chy/ripmp
her observational	data: arge log	jam at us	stream side	É
				of Bridge,
ter Quality Paran	neters Recorded (Disci	roto Somella -		
			Sample Death () (Ang
Conductivity (µS/	om): 01527		Sample Depth (m): -(Data Logger: -()	
solved Oxygen (m (s.u.):	g/L): 6.34		Secchi Depth (m):	
(s.u.): litional Comments:	7,73		Sample Time: 11:10	1 7" = 19 "
Comments:	54 0,25 , Mir	Temp 26.67	11/5	2
to Log	/	/ .		
Pic No.				
	e laf a /	Descrip		
3-5 11	ew of southwest	The second s	im side of br	id ce,
	ew of some copped	bank downst	ream side of v	radae.
$\gamma \zeta = \Lambda L^{\prime}$		A focume day	La alaca	- age
	0×1 of 1×11 (for -1			
	ewot mill Creek	= tacing up st	ceam.	
$\frac{1}{1-5} = \frac{1}{5}$	ew of Mill Creek ens of log jamb of w of North west b	- form up st 2n up stream a	ream.	o

	(
Δ	,70	12:30
A B	.70	5
C	.72	40
V D IL	.72	5
IL	.70	50
F	.72	5
G	1.71	13:00
H	.70	5
and the second designed in the second designed designed in the second designed designed in the second designed designed designed in the second designed design	1.71	10
T. J	72	. 5
K	.68	20
Ĺ	,71	5
Dup	,70	12:50
M		13:27
N	/	13:27
	ł	

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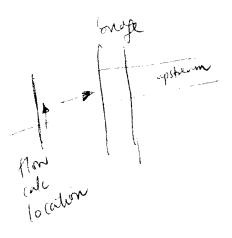
		PBS		
	Mill C	reek Contact Re	ecreation Pilot Study	
		Field Dat	a Sheet	
Sample ID.	UAA-ME-05-	0		
Station ID:	Mill Creek	Segment: C	tost Fork; NO segment IDH	F
Date: 07.	24.07	Location: U	ekert Rd. West	
Time: 🏞	<u>.</u>]]		Names: Kof: Jam	
Present Wea	ather: 5-Cloddy, Ca	Im	John Branon	
wind intensi	y: 1-Calm/		Eyer Schlitzer	
Quantity of F	ast significant rainfall (Di	ays): 4	Signature: bl CS	
	Rain (in.):	9.37		
	1707			ويرفق معين فالمحفظ بينداكم
	124	Site Charac	teristics	
Physical Cha	aracteristics			
Stream Width	(m): 157 4.100	M		
Stream Depth	1(m): 0.75			
Substrate:	and silt clay			
low (cfs):				
Data Source f	or Flow: Calculate	from Sonte		
bservationa	al Data	- Power C	a handhed flow meter.	
Ater Odor:	6-Nome		Sheen: Alone	
vater Color:	Brown-1		Pm)	
later Clarity:	Sector			
ater Surface			Deposits: Samo	
			Debris in Water: Limbs, Joss	
ow Description	on: Run		Shoreline: muchy evoded	
ow Descriptic ow Severity:	3-normal			
ow Descriptic ow Severity:	3-normal	100 100 1	11 100.0.	
ow Descriptic ow Severity:		log jamatu	11 100.0.	
ow Descriptic ow Severity:	3-normal	log jan at u	petrone and all	
ow Descriptic ow Severity:	3-normal	log jam at u	petrone and all	
ow Descriptic ow Severity: ther observat	3-normal ional data: Large	/	pstram side of bridge.	
ow Descriptio ow Severity: ther observat	3-nosmal ional data: Lage	/	pstram side of bridge.	
ow Descriptic ow Severity: ther observat ater Quality I mperature (%	3-nosmal ional data: Lage Parameters Recorded C): 20.91	(Discrete Sampling)	Sample Depth (m): 0 31	
ow Descriptic ow Severity: ther observat ater Quality I mperature (°C. Conductivity	3-nosmal ional data: Large Parameters Recorded C): Z.Q.91 (µS/cm): 556.0	(Discrete Sampling)	<u>Sample Depth (m): 0,31</u> Data Logger: VST LoopVI W	
ow Descriptic ow Severity: ther observat ater Quality I mperature (% . Conductivity solved Oxyge	<u>3-nesmal</u> ional data: Lage Parameters Recorded C): ZQ.91 (μS/cm): 556.0 en (mg/L): 5.87	(Discrete Sampling)	<u>Sample Depth (m): 0,31</u> Data Logger: VST LoopVI W	
ow Descriptic ow Severity: ther observat ater Quality I mperature (°C Conductivity solved Oxyge (s.u.):	$3 - n \approx ma$ ional data: $Lag Parameters Recorded C): 2 \vee .91 (\mu S/cm): 556.0 en (mg/L): 5.87 $	(Discrete Sampling)	Sample Depth (m): 0,3/ Data Logger: YST 600 XLM Secchi Depth (m): 0,50	
ow Descriptic ow Severity: ther observat ater Quality I mperature (% . Conductivity solved Oxyge	$3 - n \approx ma$ ional data: $Lag Parameters Recorded C): 2 \vee .91 (\mu S/cm): 556.0 en (mg/L): 5.87 $	(Discrete Sampling)	<u>Sample Depth (m): 0,31</u> Data Logger: VST LoopVI W	
ow Descriptic ow Severity: ther observat ater Quality I mperature (°(. Conductivity solved Oxyge (s.u.): ditional Comn	3-nosmal ional data: Large Parameters Recorded C): 20.91 $1(\mu$ S/cm): 556.0 en (mg/L): 5.87 269	(Discrete Sampling)	Sample Depth (m): 0,3/ Data Logger: YST 600 XLM Secchi Depth (m): 0,50	
ow Description ow Severity: ther observat ater Quality I mperature (°C. Conductivity solved Oxyge (s.u.): ditional Comm	3-nosmal ional data: Large Parameters Recorded C): 20.91 $1(\mu$ S/cm): 556.0 en (mg/L): 5.87 269	(Discrete Sampling)	Sample Depth (m): 0,3/ Data Logger: YST 600 XLM Secchi Depth (m): 0,50	
ow Descriptic ow Severity: ther observat ater Quality I mperature (% . Conductivity solved Oxyge (s.u.): ditional Comn oto Log Pic No.	<u>3-nesmal</u> ional data: Large Parameters Recorded C): Z Q.91 (μS/cm): <u>556.0</u> en (mg/L): <u>5.87</u> <u>7.69</u> nents:	(Discrete Sampling)	Sample Depth (m): 0,3/ Data Logger: YST 600 XLM Secchi Depth (m): 0,50 Sample Time: 14:11	
ow Descriptic ow Severity: ther observat ther observat ater Quality I mperature (°C. Conductivity solved Oxyge (s.u.): ditional Comn oto Log Pic No.	3 - 265 ma ional data: $Larg < 1$ Parameters Recorded (C): 20.91 $1(\mu S/cm): 556.0$ en (mg/L): 5.87 7.69 nents: View of south	(Discrete Sampling)	Sample Depth (m): 0, 3/ Data Logger: YST 600 XLM Secchi Depth (m): 0, 50 Sample Time: 14:11	
ow Description ow Severity: ther observat ther observat ater Quality I mperature (% Conductivity solved Oxyge (s.u.): ditional Comm oto Log Pic No.	3-normal ional data: Lage Parameters Recorded C): ZV.91 (μS/cm): 556.0 en (mg/L): 5.87 7.69 nents: View of south Niew of south	(Discrete Sampling) (Discrete Sampling) De De west bank, up	<u>Sample Depth (m):</u> <u>Data Logger:</u> <u>Secchi Depth (m):</u> <u>Secchi Depth (m):</u> <u>Sample Time:</u> <u>J4:</u> <u>J1</u> <u>Sample Time:</u> <u>J4:</u> <u>J1</u> <u>Sample Time:</u> <u>J4:</u> <u>J1</u>	
ow Descriptic ow Severity: ther observat ther observat ater Quality I mperature (°C. Conductivity solved Oxyge (s.u.): ditional Comn oto Log Pic No.	<u>3-nosmal</u> ional data: Lage Parameters Recorded (C): ZV.91 (μS/cm): 556.0 en (mg/L): 5.87 7.69 nents: <u>View of souther</u> <u>View of souther</u> <u>View of souther</u>	De De West bank, up east bank, down	<u>Sample Depth (m): 0,31</u> Data Logger: <u>SST 600 XLM</u> Secchi Depth (m): 0,50 Sample Time: 14:11 escription estream side of bourge.	
ow Description ow Severity: ther observat ater Quality I mperature (% Conductivity solved Oxyge (s.u.): ditional Comment of Log Pic No.	<u>3-nosmal</u> ional data: Lage Parameters Recorded (C): ZV.91 (μS/cm): 556.0 en (mg/L): 5.87 7.69 nents: <u>View of souther</u> <u>View of souther</u> <u>View of souther</u>	De De West bank, up east bank, down	<u>Sample Depth (m): 0,31</u> Data Logger: <u>SST 600 XLM</u> Secchi Depth (m): 0,50 Sample Time: 14:11 escription estream side of bourge.	
ow Description ow Severity: ther observat ther observat ater Quality I mperature (% Conductivity solved Oxyge (s.u.): ditional Comm oto Log Pic No.	3-normal ional data: Large Parameters Recorded (C): Z.V.91 (US/cm): 556.0 en (mg/L): 5.87 7.69 nents: View of south New of south View of porther	De (Discrete Sampling) De west bank, up east bank, down east bank, down est bank, down est bank, wpetr	<u>Sample Depth (m): 0,31</u> <u>Data Logger: 4ST 600 XLM</u> <u>Secchi Depth (m): 0,50</u> <u>Sample Time: 14.11</u> <u>escription</u> <u>estream side of bridge</u> <u>instream side of bridge</u> <u>stream side of bridge</u>	
ow Description ow Severity: ther observat ater Quality I mperature (% Conductivity solved Oxyge (s.u.): ditional Comment of Log Pic No.	<u>3-nosmal</u> ional data: Lage Parameters Recorded (C): ZV.91 (μS/cm): 556.0 en (mg/L): 5.87 7.69 nents: <u>View of souther</u> <u>View of souther</u> <u>View of souther</u>	(Discrete Sampling) (Discrete Sampling) De west bank, up east bank, down est bank, down est bank, work	<u>Sample Depth (m): 0,31</u> Data Logger: <u>SST 600 XLM</u> Secchi Depth (m): 0,50 Sample Time: 14:11 escription estream side of bourge.	
ow Description ow Severity: ther observat ater Quality I mperature (% Conductivity solved Oxyge (s.u.): ditional Comment of Log Pic No.	3-normal ional data: Large Parameters Recorded (C): Z.V.91 (US/cm): 556.0 en (mg/L): 5.87 7.69 nents: View of south New of south View of porther	De (Discrete Sampling) De west bank, up east bank, down east bank, down est bank, down est bank, wpetr	<u>Sample Depth (m): 0,31</u> <u>Data Logger: 4ST 600 XLM</u> <u>Secchi Depth (m): 0,50</u> <u>Sample Time: 14.11</u> <u>escription</u> <u>estream side of bridge</u> <u>instream side of bridge</u> <u>stream side of bridge</u>	

E. Coli

IA	1430	0.95
ZB	14 35	0,83
30	- 40	1.03
4 D	. 45	0.99
5Ē	- 50	0.95
6F	55	1.02
76	15:00	0,98
8 H	1 05	1.01
91	10	1.02
105	1, 15	10,86
11 K	1. 20	0.92
121	1, 24	5 0.84
No. of Concession, Name		

Flow Know Know & resperse -0.8 XO V (APR)-4-, whit is with depter 0 4th 4th 3 3 3 4 25 2.4 2.1 1.8 1.6 1.2 1 Jel: 0 30 0.25 0 84 0 12 0 72 0 87 0 89 0.86 0 87 0 874 5.91 073 Jel: 0 30 0.25 0 84 0 12 0 72 0 87 0 89 0.86 0 87 0 854 5.91 073 wara 4 flow calc. Istation

UAA 1.



		PBS&J
	Mill Cre	ek Contact Recreation Pilot Study
		Field Deine
		Field Data Sheet
Sample ID:	14A-mc-06-1	Segment: ND Segment ID
Station ID:	UAA-mc-1	Location: Mill Greek (2) / a / a / a
Date: 7	13007	the state industry & blue the
Time: La	5-35	Names: K, Carr A. Branon
Present We	ather: 2-Postly leg	ady
Wind Intensi	ity: 1- Calan	
Days since la	ast significant rainfall (Day	s): 1 a f a
Quantity of F	Rain (in.): 0.20	s): Signature: Signature:
1		
		Site Characteristics
Physical Cha	aracteristics	
Stream Width	1(m): 5,18	
Stream Depth		
Substrate:	Sand 20%	s fut loop \$7% floor Court - 3
Flow (cfs):	48.95	succopo 30 to Clay amuel 20 70
Data Source f	or Flow: Calculated	South hand held And have
Observationa	al Data	sought handheld flow tracks
Water Odor:		Sheen: Oliver
Water Color:	1-Brownish	
Nater Clarity:	Secchi	Dependent
low Departation	: Z-Ripples	Debuis i Million / Jall
low Descriptic	3-Noimal	Shoroling
Other observat	S-Normal	Chorenne. el oded - clay/vegetation
ater Quality	Parameters Recorded (DI	
	カー みんのう	
 Conductivity 	(µS/cm): 0226	Data Longer:) ST + 5-31m
		Sala Logger, 4511,79011
ssolved Oxyge		
ssolved Oxyge	7 60	Secchi Depth (m):
ssolved Oxyge	7 60	Secchi Depth (m):
ssolved Oxyge (s.u.): ditional Comm	7-85 nents/Readings taken	Secchi Depth (m): 6 . 5 M Sample Time: 13:45
ssolved Oxyge 1 (s.u.): Iditional Comm oto Log	7 60	Secchi Depth (m):
ssolved Oxyge I (s.u.): Iditional Comm oto Log Pic No.	7-85 nents/Readings taken	Secchi Depth (m): 60 0.15M Sample Time: 13:45 20-ft-upstren Salury: 0.16 Su
ssolved Oxyge I (s.u.): Iditional Comm oto Log Pic No.	7-85 nonts/Readings taken (12f bordge	Secchi Depth (m): 6. 6.15M Sample Time: 13:45 20-ft-upstren Salury: 0.16 Su Description
ssolved Oxyge I (s.u.): Iditional Comm oto Log Pic No. 29- 5	7-85 nonts/Readings taken (inf birdge)	Secchi Depth (m): 6. 6.15M Sample Time: 13:45 20-ft-upstren Salury: 0.16 Su Description
issolved Oxyge 1 (s.u.): Iditional Comm Iditional Comm Pic No. 29- 5- 30- 6	7-85 nonts/Readings taken (12f bridge View of southwas Wiew of southwas	Secchi Depth (m): 6 0.15M Sample Time: 13:45 20ft-upstreen Salury: 0'16 SU Description Heavy upstreen of bridge.
issolved Oxyge I (s.u.): Iditional Comm Pic No. 29- 5 30- 6 31- 5 32- 5	7-85 nonts/Readings taken (1) f bridge View of southwas View of southwas View of southwas View from bridge	Secchi Depth (m): 6 0.15M Sample Time: 13:45 20ft-upstrem Salury: 0.16 Su Description Henk, upstream of bridge. Hank, down stream of bridge. facing up stream,
issolved Oxyge I (s.u.): Iditional Comm Pic No. 29- 5 30- 6 31- 5 32- 5	7-85 nonts/Readings taken Ut birdge View of southwas View of southwas View from brodge View from brodge	Secchi Depth (m): 6 0.15M Sample Time: 13:45 20ff-upstreen Salury: 0.16 Su Description it bank, upstream of bridge. Hank, down stream of bridge. facing up stream,
issolved Oxyge 1 (s.u.): Iditional Comm Ioto Log Pic No. 29- 5 30-6	7-85 nonts/Readings taken Uif bridge View of southwas View from bridge View from bridge View from bridge View from bridge	Secchi Depth (m): 6 0.15M Sample Time: 13:45 20ff-upstreen Salury: 0.16 Su Description it bank, upstream of bridge. Hank, down stream of bridge. facing up stream, facing up stream, bank, upstream, bank, upstream,
issolved Oxyge I (s.u.): Iditional Comm Pic No. 29- 6 30- 6 31- 6 32- 6 32- 6	7-85 nonts/Readings taken With birdge View of southwas View of southwas View from brodge View from brodge	Secchi Depth (m): 6 0.15M Sample Time: 13:45 20ff-upstreen Salury: 0'16 Su Description it bank, upstreem of bridge. thank, down stream of bridge. facing up stream, forme down stream.

	PBS&J
Mill Cr	eek Contact Recreation Pilot Study
	Field Date Of
	Field Data Sheet
Sample ID: KAA-MC-06-2	
Station ID: UAA-ML-2	Segment: Main Fork Mill Creek 12021 Location: Mul Cark, @ Fm
Date: 7/30/07	THE CALL & THE
Time: 11.00	Names: Rof fam John Boann
Present Weather: Z-Cloudy (Par,	
Wind Intensity: 1- Calm	
Days since last significant rainfall (Day	/s): Signature: Ala
Quantity of Rain (in.): 0.20	Signature and Store
	Site Characteristics
Physical Characteristics	
Stream Width (m): 29.0 95ft	
Stream Depth (m): 0.67	
Substrate: Sand Silt	
Dette O	the second se
Observational Data	Hand held flow Trakes (Cady Alfred KS 7/80/07
Nater Odor: 6 - None	N- 4150*1
Vater Color: /- Recould	Sheen: UTO
Vator Clarity: Secch	Floatables: Leaves
Vater Surface: /- Calm	Deposits: Sand
low Description: 3- Mormal 4671 low Severity: 3- Normal	Befer Run Shoreline: proded chy/ringe
ther observational data:	in the chy riprap
stream of run 2. Recent	CISCUM VALGE (ALL ALL ALL ALL ALL ALL ALL ALL ALL A
2 plactic puits and a	Fishing activities we ted I have the
/ a a	tility Knote left behind
ater Quality David	
ater Quality Parameters Recorded (D mperature (℃): 27・0子	Iscrete Sampling) 11:15
Conductivity (µS/cm): who 48/, 0	Sample Depth (m): If D. 71m
solved Oxygen (mg/L): () - (Data Logger: VST 197017
(S.u.): 7.80	Secchi Depth (m): A UL - A O
ditional Comments/ Readings take	20f1 Cal 1110: 11175
Li Petroque I	n Lotto Salinity : 0.23
Log	
Pic No.	Description
23-6 Viewof southe	Nest bank increase it ch
View of southe	ast buck doubled bridge,
- CZ - View of Northweel	bank, up stream give of Lowland
	bank, down stream side of bridge
28-6 View from bridge	
The Internet of the second	Legan a sta
28-6 View from bridge	terring apsileam.

	PBS&J
Mill Cree	k Contact Recreation Pilot Study
	Field Data Sheet
Sample ID: MAA-ML-06-4	Segment: No Segment IAH
Station ID: 4ph)-mc-4	Location: Fast Fork Mul Greek @ Elickert
Date: 7/30/07	Names: K - Em) - Broom
Time: 1438	
Present Weather: Z- Partly Cloud	1
Days since last significant rainfall (Days)	0.04
Quantity of Rain (in.):	Signature:
	Site Characteristics
hysical Characteristics	
tream Width (m):	
tream Depth (m): 2. O	
ubstrate: [ay/Sand/ Bilt	
ow (cfs): 43/19 ata Source for Flow: Calculate	
ata Source for Flow: Calculate	Sentek handheld flow tracker
ater Odor: 10-mone	
ater Color: 1-Browingh	Sheen: None
ater Clarity: secchi	Floatables: Jeares, twigs, Logg
ater Surface: 2- Rindos	
ow Description: Rul	Debris in Water: NA Shoreline: Sulars estad
w Severity: 5- High	
ner observational data. Flowat 4	his site was too high to sample from
he water and thus all so	unpling was from bridge.
ter Quality Parameters Recorded (Dis	
Conduction (=C): d/·S/	Sample Depth (m): 0 31
Conductivity (µS/cm): 0.331.0 solved Oxygen (mg/L): 5.47	Sample Depth (m): 0.3) Data Logger: YST (c93 O V/Z
Conductivity (μ S/cm): ρ -331.0 solved Oxygen (mg/L): $5\cdot42$ s.u.): 7.69	Sample Depth (m): 0.31 Data Logger: YSI 6920 VZ Secchi Depth (m): 0.6 w (0.15)
Conductivity (μ S/cm): ρ -33], O solved Oxygen (mg/L): $5\cdot42$	Sample Depth (m): 0.3) Data Logger: YSI 6920 VZ Secchi Depth (m): 0.6 m (0.15M) Sample Time: 1438
Conductivity (μ S/cm): $0.331.0$ solved Oxygen (mg/L): 5.42 s.u.): 7.69 itional Comments:	Sample Depth (m): 0.31 Data Logger: YSI 6920 VZ Secchi Depth (m): 0.6 w 0.15m
Conductivity (μ S/cm): ρ (33), ρ solved Oxygen (mg/L): $5 \cdot 42$ s.u.): $7 \cdot 69$ tional Comments:	Sample Depth (m): 0.3) Data Logger: YSI 6920 VZ Secchi Depth (m): 0.6 m @-15M Sample Time: 1438
Imperature (-C): $\mathcal{L} / S / S / S / S / S / S / S / S / S / $	Sample Depth (m): 0.3) Data Logger: YSI 6920 VZ Secchi Depth (m): D-6 w 0.15M Sample Time: 1438 Fal 0.16
Conductivity (μ S/cm): ρ ·33], ρ solved Oxygen (mg/L): $5 \cdot 42$ s.u.): 7 \cdot 69 itional Comments: to Log Pic No.	Sample Depth (m): 0.31 Data Logger: YST 6920 VZ Secchi Depth (m): 0.6 m. Sample Time: 1438 Sample Time: 0.16 Description 0.16
Imperature (-C): 27.57 Conductivity (μ S/cm): $9.337.0$ Solved Oxygen (mg/L): 5.42 s.u.): 7.69 itional Comments: to Log Pic No. SSE-G View of Eléckert SSE-G View of Eléckert	Sample Depth (m): 0.31 Data Logger: YSI 6920 VZ Secchi Depth (m): 0-6 m 0.15M Sample Time: 14:38 Sal 0.16 Description 21. W. Jacong south across mill creek bridge.
Imperature (-C): 27.57 Conductivity (μ S/cm): $9.337.0$ Solved Oxygen (mg/L): 5.42 s.u.): 7.69 itional Comments: to Log Pic No. SSE-G View of Eléckert SSE-G View of Eléckert	Sample Depth (m): 0.31 Data Logger: YSI 6920 VZ Secchi Depth (m): 0-6 m 0.15M Sample Time: 14:38 Sal 0.16 Description 21. W. Jacong south across mill creek bridge.
Conductivity (µS/cm): 0.331.0 colved Oxygen (mg/L): 5.42 s.u.): 7.69 itional Comments: to Log Pic No. 35-6 View of theckent 7-6 View of southwest 7-6 View of southwest 8-6 View of mill creek	Sample Depth (m): 0.31 Data Logger: YSI 6920 VZ Secchi Depth (m): D-bw 0.15M Sample Time: 1438 Gal 0.16 Description 21. W. Gacong south across will creek bridge. mank, up straw gide of bridge.
Pic No. 35-6 View of Edeckert 7-6 7-6 7-6 7-6 7-6 7-6 7-6 7-6	Sample Depth (m): 0.3) Data Logger: YSI 6920 VZ Secchi Depth (m): D-bu 0.15M Sample Time: 1438 Fal 0.16 Description 21. W. Facong south across millcreek bridge. ank, up strain give of bridge. but downstreem sole of bridge. but downstreem sole of bridge. but downstreem sole of bridge.
Pic No. 35-6 View of Edeckert 7-6 7-6 7-6 7-6 7-6 7-6 7-6 7-6	Sample Depth (m): 0.31 Data Logger: YSI 6920 VZ Secchi Depth (m): D-b w 0.15M Sample Time: 1438 Gal 0.16 Description Zl. W. Gacong south across millcreek bridge. mank, up stream give of bridge.

Appendix I

Summary Statistics

	<u>/tical Results Sum</u> Use Attainability HGAC			
	UAA1	UAA2	UAA4	
Sample Event: 06/13/07 Sample ID:UAA-MC-01 Project Number: 461409.00	GRAB	GRAB	GRAB	_
PARAMETER NAME	VALUE	VALUE	VALUE	UNIT
Total Suspended Solids (TSS)	10.40	17.7	13	mg/L
Total Volatile Suspended Solids (VSS)	4.00	6.00	4.60	mg/L
Flow	0.04	22.3	2.12	cfs
Temperature	27.39	29.54	27.07	0°C
Specific Conductivity	0.673**	0.567**	0.734**	mS/cm
Dissolved Oxygen (DO)	6.89**	7.72**	6.07**	mg/L
рН	7.89	7.86	7.81	s.u.
water clarity (secchi depth)	0.21	0.46	0.53	meters
Ammonia - low level	<0.02	<0.02	<0.02	mg/L
Phosphate*	()	()	()	mg/L
TKN*	()	()	()	mg/L
Escherichia coli (Time Series)		VALUE		UNIT
1	359	109	199	MPN/100 mL
2	389	98	185	MPN/100 mL
3	211	134	74	MPN/100 mL
4	288	109	161	MPN/100 mL
5	364	52	146	MPN/100 mL
6	265	108	160	MPN/100 mL
7	520	108	161	MPN/100 mL
3	441	86	228	MPN/100 mL
	426	131	142	MPN/100 mL
10	318	63	187	MPN/100 mL
11	364	74	156	MPN/100 mL
12	369	31	98	MPN/100 mL
Duplicate	364	41	171	MPN/100 mL

* No analysis for these paramters were completed because hold times expired before these variables were added.

** These data were not used in statisitcal analysis because post-calibration did not meet TCEQ satudards.



	UAA1	UAA2	UAA4	
Sample Event: 06/22/07				
Sample ID:UAA-MC-02				
Project Number: 461409.00	GRAB	GRAB	GRAB	
PARAMETER NAME	VALUE	VALUE	VALUE	UNIT
Total Suspended Solids (TSS)	29.3	41	30.6	mg/L
Volatile Suspended Solids (VSS)	13.3	7.70	7.00	mg/L
Flow	10.19	47.1*	22.9	cfs
Temperature	26.01	26.12	26.48	°C
Specific Conductivity	0.321	0.263	0.316	mS/cm
Dissolved Oxygen (DO)	5.99	6.10	5.29	mg/L
pH	7.60	7.79	7.66	s.u.
water clarity (secchi depth)	0.3	0.3	0.3	meters
Ammonia - Iow level	0.14	<0.02	<0.02	mg/L
Escherichia coli (Cross Section Sampling)		VALUE		UNIT
1	301	426	794	MPN/100 mL
2	328	561	816	MPN/100 mL
3	278	408	933	MPN/100 mL
4	231	708	1046	MPN/100 mL
5	359	408	1374	MPN/100 mL
Duplicate	354	563	836	MPN/100 mL

* Flow calculated at 1/4th of stream segment



	UAA1	UAA2	UAA4	
Sample Event: 06/28/07(UAA-1) & 06/29/07				
(UAA-2 & UAA-4)				
Sample ID:UAA-MC-03				
Project Number: 461409.00	GRAB	GRAB	GRAB	
PARAMETER NAME	VALUE	VALUE	VALUE	UNIT
Total Suspended Solids (TSS)	18.5 ²	31.7	37.3	mg/L
Volatile Suspended Solids (VSS)	7.5	8.30	10.7	mg/L
Total Suspended Solids (TSS) Duplicate	12.7	36.3	39.3	mg/L
Volatile Suspended Solids (VSS) Duplicate	6.0	9.30	10.7	mg/L
Flow	3.76	144.8	16.01	cfs
Temperature	27.89	26.53	26.99	°C
Specific Conductivity	0.483	0.386	0.479	mS/cm
Dissolved Oxygen (DO)	5.94	6.38	5.67	mg/L
рН	7.75	7.81	7.61	S.U.
water clarity (secchi depth)	>0.45 ¹	0.4	0.3	meters
Ammonia - low level	< 0.02 ²	< 0.02	< 0.02	mg/L
Ammonia - low level Duplicate	< 0.02 ²	<0.02	<0.02	mg/L
Escherichia coli (Longitudinal Sampling)		VALUE		UNIT
1	3132	2909	464	MPN/100 mL
2	335	2909	669	MPN/100 mL
3	253	3448	738	MPN/100 mL
4	341	2359	303	MPN/100 mL
5	410	3076	109	MPN/100 mL
Duplicate	313	2187	816	MPN/100 mL

1 - The depth of the stream is 0.45 meter

2 - The values were kept out of the analysis for the samples were not collected in an appropriate manner that satisfied sampling requirements.



z

	UAA1	UAA2	UAA4	
Sample Event: 07/11/07				
Sample ID:UAA-MC-04				
Project Number: 461409.00	GRAB	GRAB	GRAB	
PARAMETER NAME	VALUE	VALUE	VALUE	UNIT
Total Suspended Solids (TSS)	12.3	34.3	25.3	mg/L
Volatile Suspended Solids (VSS)	4.70	9.00	6.00	mg/L
Flow	4.06	56.13	10.58	cfs
Temperature	28.23	28.76	28.26	°C
Specific Conductivity	0.520	0.492	0.608	mS/cm
Dissolved Oxygen (DO)	6.18	5.55	5.50	mg/L
рН	7.84	7.88	7.84	s.u.
water clarity (secchi depth)	0.46	0.4	0.53	meters
Ammonia - low level	< 0.02	0.02	0.04	mg/L
Phosphate	0.68	0.8	0.55	mg/L
TKN	7.70	9.20	8.00	mg/L
Escherichia coli (Vertical Sampling)		VALUE		UNIT
1	131	187	199	MPN/100 mL
2	216	187	109	MPN/100 mL
3	97	122	173	MPN/100 mL
Duplicate		201		MPN/100 mL



	al Results Sum se Attainability I HGAC		2	
	UAA1	UAA2	UAA4	
Sample Event: 07/24/07(UAA-1 & UAA-4) and 07/25/07 (UAA-2) Sample ID:UAA-MC-05				-
Project Number: 461409.00	GRAB	GRAB	GRAB	LINUT
PARAMETER NAME	VALUE	VALUE	VALUE	UNIT
Total Suspended Solids (TSS)	24.8	33.3	20.0	mg/L
Total Volatile Suspended Solids (VSS)	6.8	20.0	6.0	mg/L
Flow	28.56	89.48	21.84	cfs
Temperature	26.41	26.46	26.91	°C
Specific Conductivity	0.514	0.527	0.556	mS/cm
Dissolved Oxygen (DO)	6.35	6.34	5.87	mg/L
рН	7.58	7.73	7.69	s.u.
water clarity (secchi depth)	0.61	0.48	0.48	meters
Ammonia - low level	0.071	0.079	0.073	mg/L
Phosphate	0.18	0.15	0.19	mg/L
TKN	5.60	4.00	5.20	mg/L
Escherichia coli (Time Series)		VALUE		UNIT
1	233	285	275	MPN/100 mL
2	226	432	226	MPN/100 mL
3	253	464	336	MPN/100 mL
4	191	336	173	MPN/100 mL
5	183	318	109	MPN/100 mL
6	173	216	156	MPN/100 mL
7	238	185	269	MPN/100 mL
8	201	292	250	MPN/100 mL
9	226	262	201	MPN/100 mL
10	259	243	272	MPN/100 mL
11	223	275	95	MPN/100 mL
12	148	282	288	MPN/100 mL
Duplicate	256	213	269	MPN/100 mL



	UAA1	UAA2	UAA4	
Sample Event: 07/30/07				1
Sample ID:UAA-MC-06				
Project Number: 461409.00	GRAB	GRAB	GRAB	
PARAMETER NAME	VALUE	VALUE	VALUE	UNIT
Total Suspended Solids (TSS)	28.0	108.0	96.0	mg/L
Volatile Suspended Solids (VSS)	9.5	10.0	24.0	mg/L
Flow	48.95	164.7	143.19	cfs
Temperature	27.09	27.07	27.59	°C
Specific Conductivity	0.336	0.481	0.331	mS/cm
Dissolved Oxygen (DO)	6.34	6.56	5.42	mg/L
рН	7.85	7.85	7.69	S.U.
water clarity (secchi depth)	0.15	0.4	0.15	meters
Ammonia - low level	0.068	0.077	0.072	mg/L
Phosphate	0.29	0.24	0.35	mg/L
TKN	4.70	7.30	5.30	mg/L
Escherichia coli (Vertical Sampling)		VALUE		UNIT
1	3076	450	4106	MPN/100 mL
2	3448	364	1585	MPN/100 mL
3	2105	259	4352	MPN/100 mL
Duplicate			3873	MPN/100 mL



Parameters	Statistics	UAA-1	r Chemistry Stream Characteris UAA-2	UAA-4
	N	6	6	6
	Mean	20.55	44.33	37.03
	Minimum	10.40	17.70	13.00
TSS (mg/L)	Maximum	29.30	108.00	96.00
· · · · · · · · · · · · · · · · · · ·	Std.Deviation	8.07	32.11	30.08
	Std.Error	3.29	13.11	12.28
	Coefficient of Variation	0.39	0.72	0.81
	N Mean	6 7.63	6 10.17	6 9.72
	Minimum	4.00	6.00	4.60
	Maximum	13.30	20.00	24.00
TVSS (mg/L)	Std.Deviation	3.41	5.00	7.30
	Std.Error	1.39	2.04	2.98
	Coefficient of Variation	0.45	0.49	0.75
	N	6	6	6
	Mean	15.93	95.48	36.11
	Minimum	0.04	22.30	2.12
Flow (cfs)	Maximum Std Daviation	48.95	164.70	143.19
	Std.Deviation Std.Error	19.10	59.51	53.02
		7.80	24.29	21.65
	Coefficient of Variation	1.20	0.62	1.47
	N	6	6	6
	Mean	27.17	27.41	27.22
Temporatura	Minimum	26.01	26.12	26.48
	Maximum Std.Deviation	28.23	29.54	28.26
(°C)	Std.Error	0.85 0.35	1.40 0.57	0.62
				0.25
	Coefficient of Variation	0.03	0.05	0.02
	N Mean	<u>6</u> 0.47	6 0.48	6
	Minimum	0.32	0.48	0.50
Sp. Conductivity		0.67	0.57	0.32
(mS/cm)	Std.Deviation	0.13	0.09	0.16
	Std.Error	0.05	0.04	0.07
	Coefficient of Variation	0.28	0.18	0.32
	N	6	6	6
	Mean	6.28	6.44	5.64
Dissolved	Minimum	5.94	5.55	5.29
O_{10}	Maximum	6.89	7.72	6.07
(mg/L)	Std.Deviation	0.34	0.72	0.29
	Std.Error	0.14	0.29	0.12
	Coefficient of Variation	0.05	0.11	0.05
	N Mean	<u>6</u> 7.75	6	6
	Minimum	7.58	7.82	7.72
	Maximum	7.89	7.88	7.61 7.84
pH(s.u.)	Std.Deviation	0.13	0.06	0.09
	Std.Error	0.05	0.02	0.04
	Coefficient of Variation	0.02	0.01	0.01
	N	6	6	6
	Mean	0.36	0.41	0.38
	Minimum	0.15	0.30	0.15
(Caachi danth)	Maximum	0.61	0.48	0.53
(motoro)	Std.Deviation	0.17	0.06	0.16
	Std.Error	0.07	0.03	0.06
	Coefficient of Variation	0.48	0.15	0.41
, ,	N Mean	5	6	6
ļ	Minimum	0.06	0.04	0.04
	Maximum	0.02	0.02	0.02
	Std.Deviation	0.05	0.08	0.07
	Std.Error	0.02	0.01	0.03
	Coefficient of Variation	0.77	0.76	0.63
	N	3	3	3
	Mean	0.38	0.40	0.36
	Minimum	0.18	0.15	0.19
	Maximum	0.68	0.80	0.55
(mg/L)	Std.Deviation	0.26	0.35	0.18
-	Std.Error	0.15	0.20	0.10
	Coefficient of Variation	0.69	0.89	0.50
	N Mean	3	3	3
		6.00	6.83	6.17
	Minimum	4.70	4.00	5.20
	Maximum Std.Deviation	7.70 1.54	9.20	8.00
	Std.Error	0.89	2.63 1.52	1.59 0.92
		0.00	1.52	0.92

Appendix J

Additional Bacteria Analysis and Results

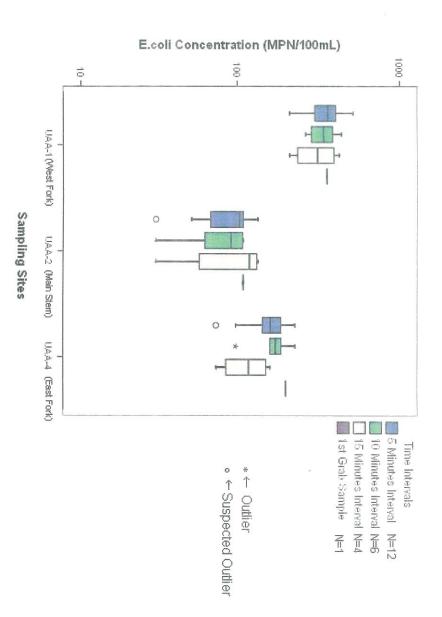
APPENDIX J

 Geomean E. coli Concentrations Obtained from Time Series Sampling vs. Normalized Flow on June 13, 2007 EC Concentrations Obtained from Cross-Section Sampling vs. Instantaneous Velocity Measured on June 22, 2007 E. coli Concentrations Obtained from Cross-Section Sampling vs. Instantaneous Depth Measured on June 28, 29, 2007 Geomean E. coli Concentrations Obtained from Longitudinal Section Sampling vs. Instantaneous Depth Measured on June 28-29, 2007 E. coli Concentrations Obtained from Longitudinal Section Sampling vs. Instantaneous Depth Measured on June 28-29, 2007 E. coli Concentrations Obtained from Longitudinal Section Sampling vs. Instantaneous Depth Measured on June 28-29, 2007 E. coli Concentrations Obtained from Longitudinal Section Sampling vs. Instantaneous Velocity Measured on June 28-29, 2007 E. coli Concentrations Obtained from Vertical Section Sampling vs. Instantaneous Velocity Measured on June 28-29, 2007 E. coli Concentrations Obtained from Vertical Section Sampling vs. Instantaneous Velocity Measured on June 28-29, 2007 Geomean E. coli Concentrations Obtained from Vertical Section Sampling vs. Velocity Measured at the Three Vertical Locations on July 11, 2007 E. coli Concentrations Obtained from Vertical Section Sampling vs. Velocity Measured at the Three Vertical Locations on July 11, 2007 Geomean EC Concentrations Obtained from Three Different Methods of Sampling vs. Normalized Flow During June and July 2007 Geomean EC Concentrations Obtained from Three Different Methods of Sampling vs. Scatter Plot Showing Geomean E. coli Concentrations vs. Quantity of Rainfall Acutin County Scatter Plot Showing Geomean E. coli Concentrations vs. Quantity of Rainfall Acuting June and July 2007
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Time Series (Event 1)

time series every 5 minutes, every 10 minutes, and every 15 minutes. Specifically, boxplots were used to data. during the sampling event at that site by its respective drainages area size in acres relationship between E. coli concentrations and normalized flow using the geometric mean of E. coli represent suspected outliers (Figure J-1). beyond the length of the whiskers are indicated with an asterisk as an outlier in the dataset. Open circles percentiles, and the "whiskers" extend from the 5th to the 95th percentiles (Figure J-1). Points that extend the middle denotes the median of the data range, the box itself represents the 25th through 75th compare the variation in E. coli concentrations during these time series. For all boxplots, the line through homogeneity of variances failed, the tests were conducted again on the natural-log transformation of the determine whether the data were normally distributed and variances were equal. If tests of normality and For the time series datasets, normality and Levene's homogeneity of variance tests were computed to concentration at each site. E. coli concentrations between sites within Event 1 when the data set represented a single grab sample, a distributed. Probability plots were constructed for the datasets to illustrate that the resulting data was normally Box-whisker plots (boxplots) were used in this study to visually compare differences in Normalized flow for each site was computed by dividing the flow measured Additionally, a scatter plot was created to explore the

this sampling event, E. coli concentrations do not vary between the first grab sample and samples taken at 5-minute, 10-minute, and 15-minute intervals at any given sample location. 10-minute, and 15-minute interval samples over a one-hour time period. The graph illustrates that during The purpose of Figure J-1 is to compare the differences between a single grab sample and 5-minute,



Time Series Sampling during Sampling Events 1 on June 13 2007 Boxplot showing E. coli Concentrations Obtained from Figure J-1

a valid method because both of the sampling events (1 and 5) were performed using the Time Series combined in order to increase the robustness of the results obtained from the regression analysis. This is concentration. Since the dataset was limited in size, the data points from Sample Events 1 and 5 were correlation between field measurements such as instantaneous depth, velocity, stream flow, and bacteria are discussed under Section 1.1.17. Sampling method. The results obtained from the regression analysis performed on the combined dataset Regression analysis were performed on the bacteria data obtained from Event 1 to understand the

Cross-Section (Event 2)

are graphically represented only in locations where E. coli, depth, and velocity were measured at the same method. Comparisons between E. coli and instantaneous velocity (velocity) and E. coli and water depth velocity (velocity) (foot/feet per second ["ft/s"]), and water depth (feet) for the cross-section sampling Scatter plots were created to explore the relationships between E. coli concentrations and instantaneous however, flow and depth data were only measured at points located 25 percent, 50 percent, and 75 percent location. E. coli samples were collected at five equally-spaced positions across the width of each site;

sampling event for the same reason. small portion of the flow (approximately 1/4 the stream width). Flow was also not analyzed for this of the stream width. Velocity and depth were not compared at the Main Stem site because conditions only allowed field team members to safely enter and collect velocity and depth measurements from a

trend suggesting there is a relationship between velocity and E. coli concentration using the cross-section according to the sample location; however, such a limited dataset is not robust enough to determine of samples collected during the pilot study the data suggest E. coli concentrations were higher at the East sampling technique. whether samples taken over a longer time period would show a different trend. Fork site in comparison with the West Fork site. Figure J-2 shows the relationship between velocity and E. coli concentration. Based on the small number would indicate a different trend. This dataset is not robust enough to determine whether more sets of samples taken No trends were detected in the scatter plot below Additionally, there is no

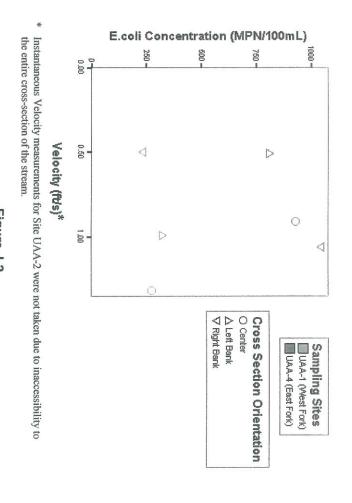
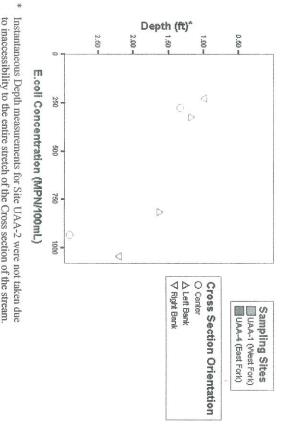


Figure J-2 EC Concentrations Obtained from Cross-Section Sampling vs. Instantaneous Velocity measured on June 22, 2007

time series sampling event; however, weather conditions also differed at these two sampling events. much higher at the East Fork site than the West Fork site. concentrations than samples collected from shallower depths. graph suggests that E. coli samples collected from areas with deeper depths resulted in higher E. coli Figure J-3 is a scatter plot showing the relationship between E. coli concentration and stream depth. This is the opposite trend detected during the In general, E. coli concentrations were This This

more sets of samples taken would indicate different trends. might be the reason for the observed differences. This dataset is not robust enough to determine whether



to inaccessibility to the entire stretch of the Cross section of the stream. Figure J-3

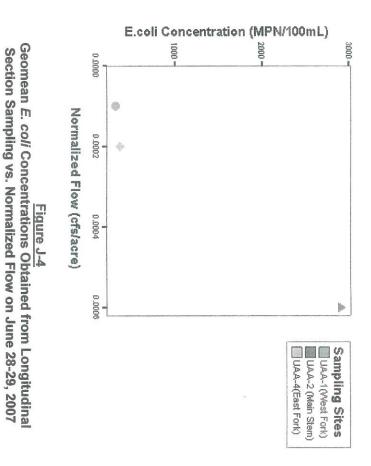
coli Concentrations Obtained from Cross-Section Sampling vs. Instantaneous Depth Measured on June 22, 2007

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Longitudinal Sections (Event 3)

normalized flow. Normalized flow for each site was computed by dividing the flow measured during the comparisons, the geometric mean of E. coli concentrations for each site was computed and compared with collected at five positions across the length of the stream reach at each site and velocity, and water depth sampling event at that site by its respective drainage area size in acres. depth comparisons and resulting equation and R-squared value are shown in the results section. For flow data were also measured. water depth (feet), and normalized flow longitudinally along each stream reach. Scatter plots were created to explore the relationships between E. coli concentrations and velocity (ft/s), Regression analysis was computed for E. coli vs. velocity, and E. coli vs. water E. coli samples were

concentrations occur under high flow conditions once flow is normalized per unit area of watershed site during the longitudinal sampling event. Based on the limited data set, it appears that higher E. coli reason an opposite trend was observed. This dataset is not robust enough to determine whether more sets field conditions were significantly different between Sampling Events 1 and 3, and this could be the upstream. Figure J-4 is a graph comparing the geometric mean E. coli concentration with normalized flows at each of samples taken would indicate different trends. This is the opposite trend that was observed during the time series sampling event; however,



comparisons of similarities and difference between sample events. No trends were shown based on the conditions also differed at these two sampling events, so this should be taken into account when making In general, E. coli concentrations were much higher at the Main Stem site compared to the East and West with deeper depths resulted in higher E. coli concentrations than samples collected from shallower depths. longitudinal sampling event. Figure J-5 is a graph comparing the E. coli concentration with stream depth at each site during the show different trends. this dataset is not robust enough to determine whether samples taken over a longer time period would location along the stream reach where the sample was collected and the E. coli concentration; however, Fork sites. This is similar to the trend detected during the cross-section sampling event; however, weather The scatter plot below suggests that E. coli samples collected from areas

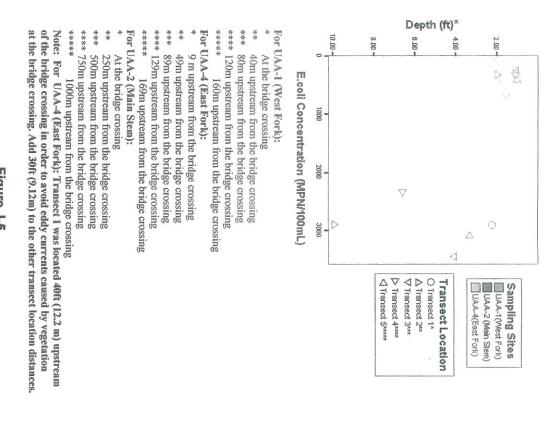


Figure J-5 ations Obtained from Longitudinal Se

in coli Concentrations Obtained from Longitudinal Section Sampling vs. Instantaneous Depth Measured on June 28-29, 2007

samples taken would indicate different trends No trends were shown based on the location along the stream reach where the sample was collected and sampling events; however, weather conditions also differed at these two sampling events, so this should and West Fork sites. suggests that there are no trends in E. coli samples collected from areas with higher velocities than lower Figure J-6 shows the relationship between E. coli concentration and velocity. be taken into account when making comparisons of similarities and differences between sample events. velocities. E. coli concentration; however, this dataset is not robust enough to determine whether more sets of In general, E. coli concentration was much higher at the Main Stem site compared to the East This is similar to the trend detected during the cross-section and longitudinal The scatter plot below

J-6

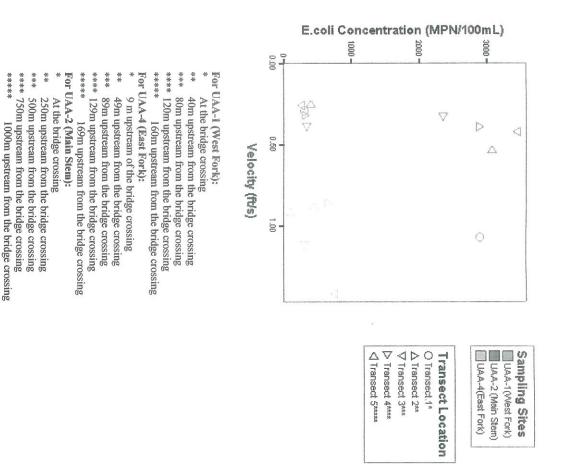




Figure J-6

glides; therefore, it was determined that this analysis would not be meaningful. were collected in water over 1.5 feet deep, and the only habitats that occurred in these areas were runs and The relationship between habitat type and E. coli concentration was considered, but all E. coli samples

Vertical Profile (Event 4)

and velocity and E. coli and sample depth are graphically represented only in locations where E. coli, at surface, middle, and bottom locations in the water column at each site. depth from which the sample was taken (sample depth), and normalized flow for E. coli samples collected Scatter plots were created to explore the relationships between E. coli concentrations and velocity (ft/s), sample depth, and velocity were measured at the same location. Regression analysis was computed for Comparisons between E. coli

respective drainage area size in acres. each site was computed by dividing the flow measured during the sampling event at that site by its concentrations for each site was computed and compared with normalized flow. Normalized flow value are E. coli vs. velocity, and E. coli vs. sample depth comparisons and the resulting equation and R-squared shown in the results section. For flow comparisons, the geometric mean of E. coli for

dataset are discussed under Section 1.1.1.8. Section Sampling method. This is a valid method because both of the sampling events (4 and 6) were performed using the Vertical were combined in order to increase the robustness of the results obtained from the regression analysis bacteria concentration. Since the dataset was limited in size, the data points from Sample Events 4 and 6 individual correlation between field measurements such as instantaneous depth, velocity, stream flow, and Regression analyses were performed on the bacteria data obtained from Event 4 to understand The results obtained from the regression analysis performed on the combined the

Time Series (Event 5)

concentrations and normalized flow using the geometric mean of E. coli concentration at each site of the data range, the box itself represents the 25th through 75th percentiles, and the "whiskers" extend concentrations during these time series. For all boxplots, the line through the middle denotes the median within Event 5 when the data set represented a single grab sample, a time series every 5 minutes, every (boxplots) were used in this study to visually compare differences in E. coli concentrations between sites normality and homogeneity of variances failed even upon transformation of data. Box-whisker plots variances, the tests were conducted on the natural-log transformation of the data. However, the tests of and variances were equal. Upon failure of the data to satisfy the tests of normality and homogeneity of homogeneity of variance tests were performed to determine whether the data were normally distributed For the time series bacteria dataset collected from Sampling Event 5, that site by its respective drainages area size in acres. Normalized flow for each site was computed by dividing the flow measured during the sampling event at (Figure J-1). indicated with an asterisk as an outlier in the dataset. from the 5th to the 95th percentiles (Figure J-1). Points that extend beyond the length of the whiskers are 10 minutes, and every 15 minutes. Additionally, a scatter plot was created to explore the relationship between Specifically, boxplots were used to compare the variation in Open circles represent suspected outliers normality and Levene's E E. coli coli

were dataset are discussed under Section 1.1.1.7. Series Sampling method. This is a valid method because both of the sampling events (1 and 5) were performed using the Time bacteria concentration. Since the dataset was limited in size, the data points from Sample Events 1 and 5 individual correlation between field measurements such as instantaneous depth, velocity, stream flow, and Regression analysis were performed on the bacteria data obtained from Event 1 to understand combined in order to increase the robustness of the results obtained from the regression analysis The results obtained from the regression analysis performed on the combined the

5-minute, 10-minute, and 15-minute intervals at any given sample location. this sampling event, E. coli concentrations do not vary between the first grab sample and samples taken at 10-minute and 15-minute interval samples over a one-hour time period. The graph illustrates that during The purpose of Figure J-7 is to compare the differences between a single grab sample and 5-minute,

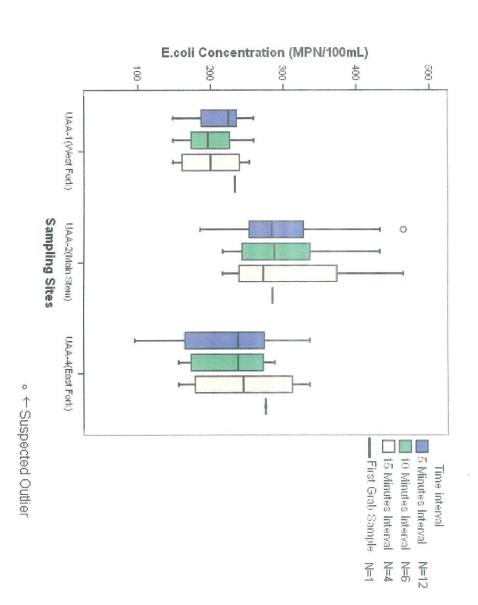


Figure J-7 Boxplot showing *E. coli* Concentrations Obtained from Time Series Sampling on July 24-25, 2007

were Regression analyses were performed on the bacteria data obtained from Event 5 to understand the dataset are discussed under Section 1.1.1.7. Series Sampling method. This is a valid method because both of the sampling events (1 and 5) were performed using the Time bacteria concentration. Since the dataset was limited in size, the data points from Sample Events 1 and 5 individual correlation between field measurements such as instantaneous depth, velocity, stream flow, and combined in order to increase the robustness of the results obtained from the regression analysis. The results obtained from the regression analysis performed on the combined

J-9

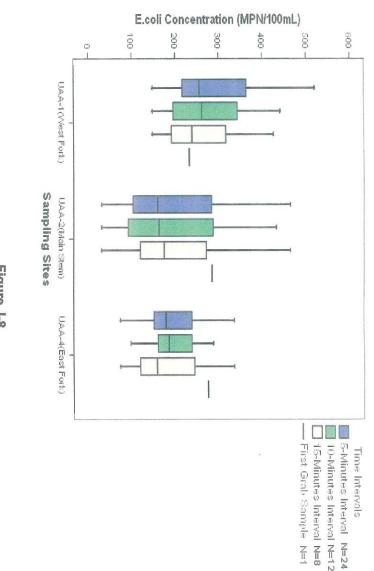
Vertical Profile (Event 6)

and velocity and E. coli and sample depth are graphically represented only in locations where E. coli, at surface, middle, and bottom locations in the water column at each site. respective drainage area size in acres each site was computed by dividing the flow measured during the sampling event at that site by its concentrations for each site was computed and compared with normalized flow. Normalized flow for value are shown in the results section. E. coli vs. velocity, and E. coli vs. sample depth comparisons and the resulting equation and R-squared sample depth and velocity were measured at the same location. depth from which the sample was taken (sample depth), and normalized flow for E. coli samples collected Scatter plots were created to explore the relationships between E. coli concentrations and velocity (ft/s), For flow comparisons, the geometric mean of Regression analysis was computed for Comparisons between E. coli E. coli

This is a valid method because both of the sampling events (4 and 6) were performed using the Vertical were combined in order to increase the robustness of the results obtained from the regression analysis bacteria concentration. Since the dataset was limited in size, the data points from sample Event 4 and 6 individual correlation between field measurements such as instantaneous depth, velocity, stream flow, and dataset are discussed under Section 1.1.1.8 Section Sampling method. Regression analyses were performed on the bacteria data obtained from Event 6 to understand the The results obtained from the regression analysis performed on the combined

Method Comparison of Bacteria Data Obtained from Sampling Events 1 and 5 Using Time Series Sampling

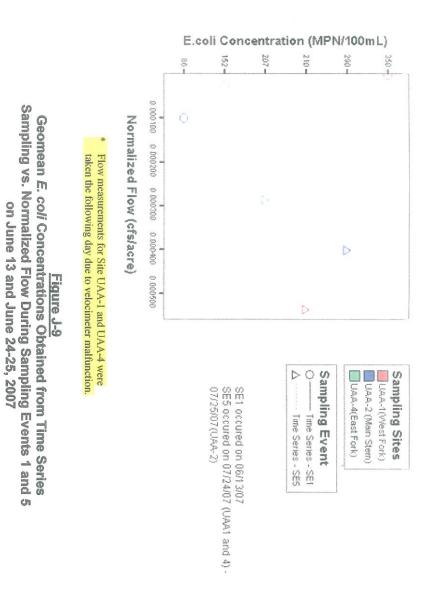
this sampling event, E. coli concentrations do not vary between the first grab sample and samples taken at compared with the single grab sample obtained from sample Event 1. 5-minute, 10-minute, and 15-minute intervals at any given sample location. for sample Events 1 and 5 were combined in order to increase the robustness The bacteria data for 5-minute, 10-minute, and 15-minute interval samples over a one-hour time period Figure J-8 illustrates that during of the boxplots and



<u>Figure J-8</u> Boxplot showing *E. coli* Concentrations Obtained from Time Series Sampling During Sampling Events 1 and 5 on June 13 and July 24-25, 2007

for Sampling Event 5. sites UAA-1(West Fork) and UAA-4 (East Fork) was performed on July 24 and 25, 2007, respectively, subsequent day at two of the three sampling locations for Sampling Event 1. Figure J-9 illustrates the relationship between flow and E. coli concentration. Flow was measured on the The sampling activity at

methods of sampling expectations and the results obtained from other sample event,s which were conducted based on different graph are normalized per unit area of watershed upstream of each site. These results are consistent with appears that higher E. coli concentrations occur under higher flow conditions. Based on the results from the regression analysis on the combined data from sample Events 1 and 5, it Flows indicated in the

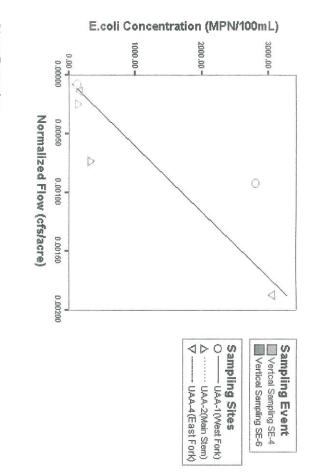


Comparison of Bacteria Data Obtained from Sampling Events 4 and 6 Using Vertical Section

Sampling Method

results obtained from other sample events, which were conducted based on different methods of sampling per unit area of watershed upstream of each site. These results are consistent with expectations and the from the regression analysis on the combined data from sample Events 1 and 5, it appears that higher site during the Sampling Events 4 and 6 using the vertical section sampling method. Based on the results Figure J-10 is a graph comparing the geometric mean E. coli concentration with normalized flows at each E. coli concentrations occur under higher flow conditions. Flows indicated in the graph are normalized

J-12



Linear Regression: *E. coli* Concentration (MPN/100mL) = (-86.40) + 1793611.03 * Normalized Flow (cfs/acre) R-Square = 0.75

Figure J-10 Geomean E. coli Concentrations Obtained from Vertical Section Sampling vs. Normalized Flow from Sampling Events Conducted on July 11 and July 24-25 2007

are found to be the highest at the East Fork site and lowest at the Main Stem site. suggests that higher E. coli concentrations occur under areas with higher velocities than lower velocities. Figure J-11 shows the relationship between E. coli concentration and velocity. Velocity was highest at the East Fork site and lowest at the Main Stem site, and the E. coli concentrations The scatter plot below

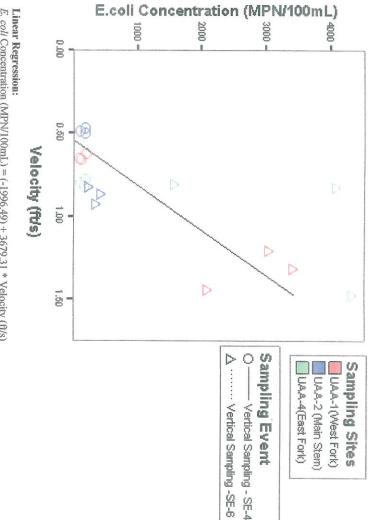
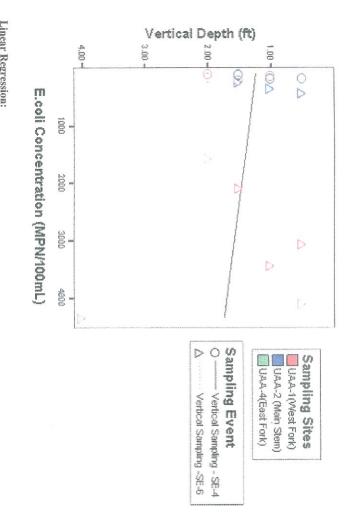




Figure 11 E. coli Concentrations Obtained from Vertical Section Sampling vs. Velocity Measured at the Three Vertical Locations During Sampling Events Conducted on July 11 and July 24-25 2007

correlation trend. stream. plot showing E. coli samples collected from areas with varying vertical depths from the surface of the Events 4 and 6 using the vertical section sampling method. No inference could be drawn from the scatter Figure J-12 is a graph comparing E. coli concentration with sample depths measured during Sampling This could be attributed to limited data points and was found insufficient to determine a

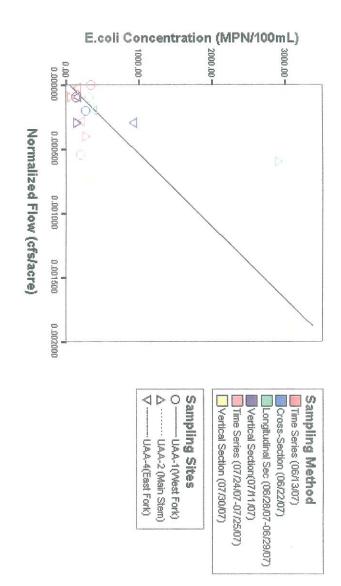


Linear Regression: *E. coli* Concentration (MPN/100mL) = (1.22) + 0.00 * Vertical Depth (feet) R-Square = 0.05

Figure J-12 EC Concentrations Obtained from Vertical Section Sampling vs. Vertical Depth from Sampling Events Conducted on July 11 and July 30, 2007

Rainfall and Pooled Flow Analysis

conditions. Flows indicated in the graph are normalized per unit area of watershed upstream of each site. results from the regression analysis, it appears that higher E. coli concentrations occur under higher flow site during all the sampling events using different sampling methods in June and July 2007. Based on the which were conducted based on different methods of sampling. Figure J-13 is a graph comparing the geometric mean E. coli concentration with normalized flows at each These results are consistent with expectations and the results obtained from the individual sample events,

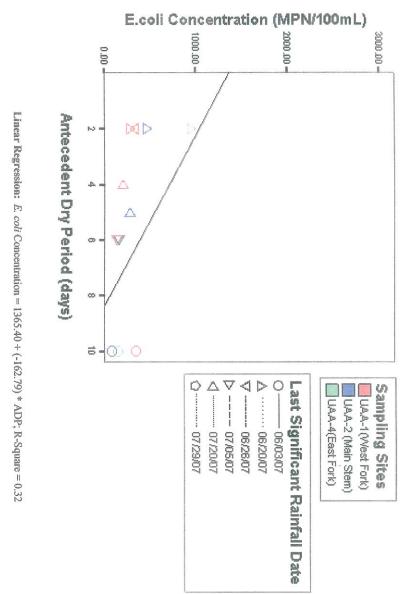


Linear Regression: *E. coli* Concentration (MPN/100mL) = 43.77 + 1772986.77 * Normalized Flow (cfs/acre) R-Square = 0.6

Geomean EC Concentrations Obtained during Six Sampling Events vs. Normalized Flow during June and July 2007 Figure J-13

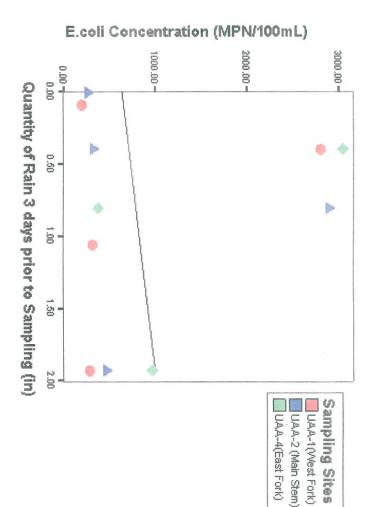
should be noted that each point on the graph represents a different sample size. samples were conducted differently during each sampling event and yielded varying sample sizes. abnormally high E. coli concentrations is driving this relationship. N=12, green and blue shapes represent N=5, purple and yellow shapes represent N=3. R-squared value calculated from a regression analysis; however, it appears that one sample and sample locations were pooled. Overall, higher normalized flows were correlated with high E. coli concentrations when all sample events The strength of this relationship is moderately high based on the Also, methods for collecting these Red shapes represent with It

collecting these samples were conducted differently during each sampling event and yielded varying shorter ADP's. duration of the ADP prior to sampling. Figure J-14 is a scatter plot representing a regression analysis comparing E. coli concentration to the sample sizes The strength of this relationship is moderate (R-squared value = 0.32). The data suggest that higher E. coli concentration occur during Also, methods for





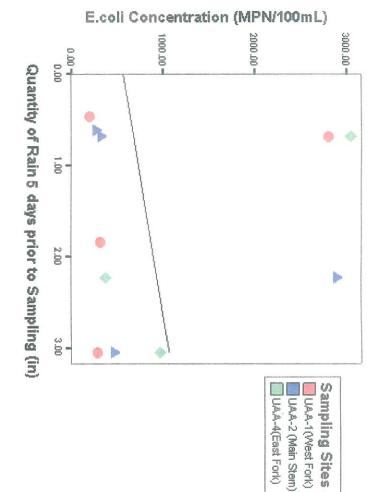
the these samples were different during each sampling event and yielded varying sample sizes. abnormally high E. coli concentrations may be affecting this relationship. Also, methods used to collect rainfall occurs three days prior to the sample date. rainfall three days prior to sampling. Figure J-15 represents the resulting scatter plot from the regression analysis conducted on cumulative R-squared value calculated from a regression analysis; however, Overall, higher E. coli concentrations are observed when more The strength of this relationship is very low based on it appears one sample with



Linear Regression: *E. coli* Concentration = 639.22 + 186.50 * Quantity of Rain accumulated three days prior; R-Square = 0.02

Scatter Plot Showing Geomean E. coli Concentrations vs. Quantity of Rainfall Accumulated Three Days Prior to the Sampling Event Conducted During June and July on Mill Creek, Austin County Figure J-15

abnormally high E. coli concentrations may be affecting this relationship. Also, methods used to collect occurs five days prior to the sample date. rainfall five days prior to sampling. Again, higher E. coli concentrations are observed when more rainfall these samples were different during each sampling event and yielded varying sample sizes. R-squared value calculated from a regression analysis; however, it appears that one sample with Figure J-16 represents the resulting scatter plot from the regression analysis conducted on cumulative The strength of this relationship is very low based on the



Linear Regression: *E. coli* Concentration = 568.48+ 163.37 * Quantity of Rain accumulated five days prior; R-Square = 0.03

Figure J-16

Scatter Plot Showing Geomean *E. coli* Concentrations vs. Quantity of Rainfall Accumulated Five Days Prior to the Sampling Event Conducted During June and July on Mill Creek, Austin County

rainfall 10 days prior to sampling. Again, higher E. coli concentrations are observed when more rainfall these samples were different during each sampling event and yielded varying sample sizes. abnormally high E. coli concentrations may be affecting this relationship. Also, methods used to collect R-squared value calculated from a regression analysis; however, it appears that one sample with occurs 10 days prior to the sample date. Figure J-17 represents the resulting scatter plot from the regression analysis conducted on cumulative The strength of this relationship is very low based on the

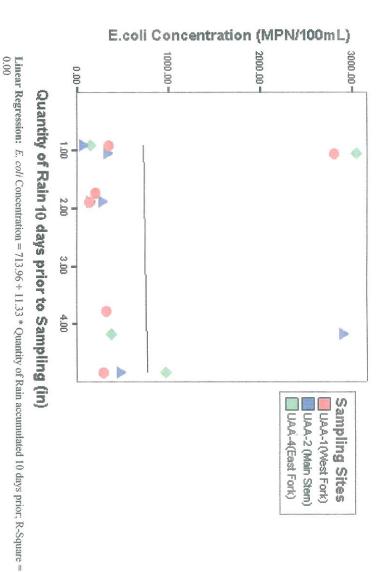


Figure J-17 Scatter Plot Showing Geomean *E. coli* Concentrations vs. Quantity of Rainfall Accumulated 10 Days Prior to the Sampling Event conducted During June and July on Mill Creek, Austin County.

Rainfall Analysis (All Events)

size in acres. The resulting equation and R-squared value are shown in the results section computed by dividing the flow measured during the sampling event at that site by its respective drainage concentration for each sample event at each site to normalized flow. Normalized flow for each site was correlation of the pooled data. event differed, a regression analysis was conducted on all flow data together to evaluate the possible experienced prior to each sampling event. each sampling event. Regression analysis was computed for E. coli vs. cumulative rainfall for three, five, and ten days prior to R-squared value, which are shown in the results section. Although the sample size for each sampling Additional regression analysis was conducted to compare E. coli vs. the ADP This was conducted by comparing the geometric mean of E. coli All comparisons resulted in a regression equation and

Appendix K

Contact Recreation interview Forms

Field Data Sheet for Recreational Use Stream Survey

Data Sheet D—Recreational Use Interview
Stream Name Eastfork Millice, h Segment # UAAA
I. Introduction 7-16.07
Date & Time (include AM or PM): 7/13/07 MAS 3:00 pm
Interviewed: In person By phone By mail (NOTE: If you are an Interviewee filling out this form to mail back to the TCEQ, proceed to Question #1.)
Interviewee selected because (e.g., house next to stream; standing by stream, etc.) met this man at the general Store. He knew First non-labout the stream
Interviewer introduction to Interviewee: "My name is, I work for(name of your employer), and I am collecting information on how people use(name of the stream)
ASK:
 1.) Are you willing to respond to a survey about this stream? (It will just take a few minutes.) Wes I No If yes, list contact information for the interviewee below: (Do not collect name or contact information if interviewee is a minor)
Legal name: MAH Mach Current mailing address: 11/69 HWY 159 W Belliv. 110 Daytime phone number: (979) 357-2335
E-mail address (optional):
2.a.) Do you live in this area? If yes, how many years?
2.b.) If you don't live nearby, are you still familiar with this stream? Yes No If yes, how many years?
If no, thank the individual for taking the time to talk to you and conclude the interview.
 3.) Are you familiar with this particular stretch of the stream? (show them the map, pointing out local landmarks such as roads, bridges, property lines) Yes No If yes, proceed to "II. Personal Use?" If no, proceed to Section V.
4.) Do you know if it has rained here recently Yes No If so, when was the last rainfall today
II. Personal Use
 Have you or your family personally used the stream for recreation? Yes No If yes, proceed to #3.
If no, proceed to #2.
2.a.) List reasons stream not used.
2.b.) Proceed to "III. Witnessed Use?".
3.) How do you use the stream? Figh, jon Good
27 of 32 Contact Recreation UAA Draft Protocol
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	Primary Contact Recreation Swimming Tubing Snorkeling/Skin Diving Water Skiing
	If Interviewee (or family) used the stream for primary contact recreation, ask:
	4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
	4.b.) Where, exactly? Describe specific location and mark on the map (See map requirements in the protocol).
	Secondary Contact Recreation Fishing Wading Boating Trapping Other:
	If Interviewee (or family) used the stream for secondary contact recreation, ask:
	4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? About Syrs
] i	III. Witnessed Use .) Have you observed others using this stream for recreation? Yes No
	If yes, proceed to #2. If no, proceed to, "IV. Anecdotal Use".
2	.) What kinds of uses have you witnessed?
	Primary Contact Recreation Swimming Tubing Snorkeling Skin Diving Water Skiing
If	
	Interviewee witnessed primary contact recreation uses, ask:
	a.) When (e.g., year(s)?; season?; only after arrain?) and how often (times year)?
4.	a.) When (e.g., year(s)?; season?; only after arrain?) and how often (times, year)?
ļ.	a.) When (e.g., year(s)?; season?; only after a raip?) and how often (times/year)?

e v í

	Secondary Contact Recreation Fishing Wading Boating Trapping Other:
If I	nterviewee witnessed secondary contact recreation, ask:
4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
	2-3 Times / yrinday
4.d.) Where, exactly? Describe specific location and mark on the map. Auchole
1.) H	Anecdotal Use lave you heard about anyone using this stream for recreation – not seen or done yourself, but just hea t it? Yes No
	If yes, proceed to #2. If no, thank the individual for taking the time to talk to you and conclude the interview.
2.) W	hat kind of uses have you heard about? Swin wing
	Primary Contact Recreation
	Swimming Tubing Snorkeling Skin Diving Water Skiing
If Inte	rviewee has heard about primary contact recreation, ask:
4.a.) V	When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
	50 years acro
4.b.) V	here, exactly? Describe specific location and mark on the map
	Blue hole
	Secondary Contact Recreation
	Fishing Wading Boating Trapping Other:
If Interv	viewee (or family) used the stream for secondary contact Recreation, ask:
	hen (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
	\bigcirc
	Jace
4 d) WF	ere, exactly? Describe specific location and mark on the map.
(.u.) ((1)	
	Acre

V. Others to Contact Can you recommend someone else we could contact that knows the stream? Yes No If yes, that person's contact info (name, address, phone, directions?) Charles Leschel ACCEPT- 2000
If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments

1.) From the Interviewee:		
2.) From the Interviewer:		
II. Data Collectors Information		
Ias interviewer been trained by TCEQ or designee to conduct UAA Interviews? If yes, how (check all that apply)	· Yes	No
las interviewer been trained by TCEQ or designee to conduct UAA Interviews? If yes, how (check all that apply)	e. Yes	No
Ias interviewer been trained by TCEQ or designee to conduct UAA Interviews? If yes, how (check all that apply) Workshop? (if so, enter date):	eYes	No
las interviewer been trained by TCEQ or designee to conduct UAA Interviews? If yes, how (check all that apply)	eYes	No

Printed Name: John Bramon & Jesse Moya
Employer (where applicable): PBS4J
Interviewer's phone #: 281-493-5100 E-mail: jrbranom@pbsj.com Signature:

Field Data Sheet for Recreational Use Stream Survey

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Data Sheet D—Recreational Use Interview

Stream Name_MM_Creek	Segment # MAin Fork
I. Introduction	
Date & Time (include AM or PM): 6/13/07 //:	00 am
Interviewed: In person By phone By mail (NOTE: If you are an Interviewee filling out this form to mail back	k to the TCEQ, proceed to Question #1.)
Interviewee selected because (e.g., house next to stream; standing 10 cdge of Stitam.	g by stream, etc.) Walked down
Interviewer introduction to Interviewee: "My name is, employer), and I am collecting information on how people us	, I work for(name of your e(name of the stream)
ASK: 1.) Are you willing to respond to a survey about this stream? (It w Yes No If yes, list contact information for the i (Do not collect name or contact information)	nterviewee below: on if interviewee is a minor)
Legal name: Current mailing address: Daytime phone number: ()	
E-mail address (optional):	
: 2.a.) Do you live in this area? • Yes No If yes, how many years?	
2.b.) If you don't live nearby, are you still familiar with this stream If yes, how many years?	? Yes No
If no, thank the individual for taking the time to talk to you	u and conclude the interview.
 3.) Are you familiar with this particular stretch of the stream? (sho landmarks such as roads, bridges, property lines) Yes If yes, proceed to "II. Personal Use?" If no, proceed to Section V. 	w them the map, pointing out local No
4.) Do you know if it has rained here recently Yes No I	f so, when was the last rainfall
II. Personal Use	
 Have you or your family personally used the stream for recreating Yes No If yes, proceed to #3. If no, proceed to #2. 	ion?
2.a.) List reasons stream not used.	
2.b.) Proceed to "III. Witnessed Use?".	Contact Recreation Li VA Draft Protosol

Contact Recreation UAA Draft Protocol

Primary Contact Recreation Swimming Fubing Snorkeling Skin Diving Water Skiing
If Interviewee (or family) used the stream for primary contact recreation, ask:
4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
4.b.) Where, exactly? Describe specific location and mark on the map (See map requirements in the protocol).
Secondary Contact Recreation Fishing Wading Boating Trapping Other: If Interviewee (or family) used the stream for secondary contact recreation, ask:
4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? <u>Every once</u> in a while.
4.d.) Where, exactly? Describe specific location and mark on the map. Mill Creek 6 FM 2479 III. Witnessed Use 1.) Have you observed others using this stream for recreation?
If yes, proceed to #2. If no, proceed to, "IV. Anecdotal Use".
2.) What kinds of uses have you witnessed?
Primary Contact Recreation
Swimming Tubing Snorkeling/Skin Diving Water Skiing
If Interviewee witnessed primary contact recreation uses, ask:
4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times year)?
N A
4.b.) Where, exactly? Describe specific location and mark on the map.
NA

4,

Secondary Contact Recreation Fishing Wading Boating Trapping Other:
If Interviewee witnessed secondary contact recreation, ask:
4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
N//
4.d.) Where, exactly? Describe specific location and mark on the map
NA
IV. Anecdotal Use 1.) Have you heard about anyone using this stream for recreation – not seen or done yourself, but just heard about it? Yes No If yes, proceed to #2. If no, thank the individual for taking the time to talk to you and conclude the interview.
2.) What kind of uses have you heard about?
Primary Contact Recreation Swimming Tubing Snorkeling Skin Diving Water Skiing
If Interviewee has heard about primary contact recreation, ask:
4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
4.b.) Where, exactly? Describe specific location and mark on the map
NA
Secondary Contact Recreation Fishing Wading Boating Trapping Other:
If Interviewee (or family) used the stream for secondary contact Recreation, ask:
4.c.) When (e.g., year(s)?: season?; only after a rain?) and how often (times/year)?
NA
4.d.) Where, exactly? Describe specific location and mark on the map.
N P

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V. Others to Contact			
Can you recommend someone else we could contact that knows the stream? If yes, that person's contact info (name, address, phone, directions?)	Yes	No	

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments
1.) From the Interviewee: A Man and his two Sons walked down to the waters adge to see if conditions were job tos fishing and to see of we were fishing.
and to see if we were fishing.
2.) From the Interviewer: These people did not stay longor provide any additional inter nation.
provide any additional infer notion.
11
VII. Data Collectors Information
Has interviewer been trained by TCEQ or designee to conduct UAA Interviews? Yes No
If yes, how (check all that apply)
Workshop? (if so, enter date):
On-line training seminar?
Followed Interview Instruction Sheets?
Other
Interviewer Information:
Printed Name: John Branom
Employer (where applicable): $PBS4J$
Interviewer's phone #: 281-529-413/ E-mail: jr banan@pbsj.com
Similar Alla
Signature. Aftroco
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Field Data Sheet for Recreational Use Stream Survey

Data Sheet D—Recreational Use Interview
Stream Name
I. Introduction
Date & Time (include AM or PM): <u>June 4, 2007</u> pm Interviewed: XIn person By phone By mail
Interviewed: In person By phone By mail (NOTE: If you are an Interviewee filling out this form to mail back to the TCEQ, proceed to Question #1.)
Interviewee selected because (e.g., house next to stream; standing by stream, etc.) Local Resident of Bellville
Interviewer introduction to Interviewee: "My name is, I work for(name of your employer), and I am collecting information on how people use(name of the stream)
ASK: 1.) Are you willing to respond to a survey about this stream? (It will just take a few minutes.) Yes No If yes, list contact information for the interviewee below: (Do not collect name or contact information if interviewee is a minor)
Legal name: <u>Arlie Kendrick</u> Current mailing address: <u>30 S. Holland Belluille</u> TX 77418 Daytime phone number: 971) 865-3136
Ē-mail address (optional): N/ K
2.a.) Do you live in this area? $40 + years$
2.b.) If you don't live nearby, are you still familiar with this stream? Yes No N/12 If yes, how many years?
If no, thank the individual for taking the time to talk to you and conclude the interview.
 3.) Are you familiar with this particular stretch of the stream? (show them the map, pointing out local landmarks such as roads, bridges, property lines) X Yes No If yes, proceed to "II. Personal Use?" If no, proceed to Section V.
4.) Do you know if it has rained here recently χ Yes No If so, when was the last rainfall May 28
II. Personal Use
 1.) Have you or your family personally used the stream for recreation? Yes No If yes, proceed to #3. If no, proceed to #2.
2.a.) List reasons stream not used. US wally go to Brazos River or Lake Summer ville Of Go Brazos River or
2.b.) Proceed to "III. Witnessed Use?".
3.) How do you use the stream?

•

	Swimm	ing Fi		Contact Recreatio		Water Skiing
If Interviewe	e (or family)	used the st	tream for prin	mary contact recrea	ition, ask:	
						ear)?
4.b.) Where, the protocol)	exactly? Des	cribe speci	ific location a	ind mark on the ma	ıp (See m	ap requirements in
	Fishing	Wading	Secondary Boating	Contact Recreation	on Other: _	
4.c.) When (6	e.g., year(s)?;	season?; o	only after a ra		(times ye	k: ear)?
I II. Witnes	ssed Use					
lf no	es No s. proceed to , proceed to, ' s of uses have	IV. Anecc				
,	Swimmi		Primary Co	o ntact Recreation orkeling Skin Divi	ng	Water Skiing
Interviewee	witnessed pr	mary cont	act recreation	1 uses, ask:		
	g., year(s)?; s	eason?; on	ly after a rain	1?) and how often (times yea	ar)? Kids
.a.) When (e.	e au	enne	g the	Summer	- 60	pecially,

ť

Secondary Contact Recreation XFishing Wading Boating Trapping Other:
If Interviewee witnessed secondary contact recreation, ask:
4.c.) When (e.g., year(s)?: season?: only after a rain?) and how often (times, year)? Summer and any time are fishing
4.d.) Where, exactly? Describe specific location and mark on the map. Inected to
IV. Anecdotal Use Have you heard about anyone using this stream for recreation – not seen or done yourself, but just heard about it? Yes No If yes, proceed to #2.
If no, thank the individual for taking the time to talk to you and conclude the interview.
2.) What kind of uses have you heard about? <u>Swinneng</u> , tubing fishing Primary Contact Recreation
Primary Contact Recreation Swimming Tubing Snorkeling Skin Diving Water Skiing
If Interviewee has heard about primary contact recreation, ask:
4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? <u>Summer</u> but any time
4.b.) Where, exactly? Describe specific location and mark on the map <u>Dinected to</u>
Secondary Contact Recreation XFishing XWading Boating Trapping Other:
If Interviewee (or family) used the stream for secondary contact Recreation, ask:
4.c.) When (e.g., year(s)?: season?; only after a rain?) and how often (times: year)? any time wale is high provide the due up in upper reached during 55ml
4.d.) Where, exactly? Describe specific location and mark on the map. Joe Goebel

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v. Others to Contact				
Can you recommend someone else we could contact that knows the stream? If yes, that person's contact info (name, address, phone, directions?) ?)	ΥY	es	No
			And the second second second second	the second se

be Goebe	K

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments

1.) From the Interviewee:
2.) From the Interviewer:

VII. Data Collectors Information

Has interviewer been trained by TCEQ or designee to conduct UAA Interviews? If yes, how (check all that apply)	XYes	No
Workshop? (if so, enter date):		
On-line training seminar?		
Followed Interview Instruction Sheets?		
Xother Draft Protocol May 07		
Interviewer Information:		
Printed Name: Marisa Weber, Casey Ha Employer (where applicable): PBSJ	ndin)
Interviewer's phone #28/493 5100 E-mail: Mrweber @g Signature: Man Will	pbsj (a	- M

Field Data Sheet for Recreational Use Stream Survey

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Data Sheet D—Recreational Use Interview
Stream Name Mill Creak West Fack Segment # UAAI
I. Introduction
Date & Time (include AM or PM): 7-16-07 400 PM
Interviewed: χ In person By phone By mail (NOTE: If you are an Interviewee filling out this form to mail back to the TCEQ, proceed to Question
Interviewee selected because (e.g., house next to stream; standing by stream, etc.)
Interviewer introduction to Interviewee: "My name is, I work for(name of your employer), and I am collecting information on how people use(name of the stream)
ASK: 1.) Are you willing to respond to a survey about this stream? (It will just take a few minutes.) Yes No If yes, list contact information for the interviewee below: (Do not collect name or contact information if interviewee is a minor) Legal name: <u>Evenett</u> Fred Stread Schmidt Current mailing address: <u>2010 Blue hole</u> Rd Daytime phone number: (179) 357-4760
E-mail address (ontional).
: 2.a.) Do you live in this area? XYes No If yes, how many years? >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
2.b.) If you don't live nearby, are you still familiar with this stream? Yes No If yes, how many years?
If no, thank the individual for taking the time to talk to you and conclude the interview.
 3.) Are you familiar with this particular stretch of the stream? (show them the map, pointing out local landmarks such as roads, bridges, property lines) Are so in No If yes, proceed to "II. Personal Use?" If no, proceed to Section V.
4.) Do you know if it has rained here recently Yes No If so, when was the last rainfall toda
II. Personal Use
1.) Have you or your family personally used the stream for recreation? Yes No
If yes, proceed to #3. If no, proceed to #2.

Contact Recreation UAA Draft Protocol

	Swimming	Primary Contact Tubing Snorkeli	t Recreation ng/Skin Diving	Water Skiing
		stream for primary co		k: xM 7/16/0
4.a.) When (e., <u>Cuery</u>	g., year(s)?; season' eas fishin	; only after a rain?) and	d how often (times	1 1
4.b.) Where, extra the protocol).	actly? Describe spe Blaght ale	cific location and mark	c on the map (See) m フバロビー	nap requirements in
ĸ	ishing Wading	Secondary Contact Boating	Recreation apping Other:	
If Interviewee (or family) used the	stream for secondary co	ontact recreation, a	sk:
4.c.) When (e.g. <u>Cocole 4</u>	, year(s)?; season?;	only after a rain?) and $H_{L} = \frac{E_{S} > e_{C_{L}}}{E_{S} > e_{C_{L}}}$	how often (times/y	ear)? Fished A
4.d.) Where, exa	ctly? Describe spec	ific location and mark	on the man RI	
			on the map. <u>Dre</u>	e Itole ARex
III. Witnessee 1.) Have you obs X Yes	d Use erved others using t No	his stream for recreatio		<u>e Hole Area</u>
III. Witnessee 1.) Have you obs X Yes If yes, pr If no, pre	d Use erved others using t wo roceed to #2. poceed to, "IV. Aneco	his stream for recreatio dotal Use".		<u>e Hole Arek</u>
III. Witnessee 1.) Have you obs X Yes If yes, pr If no, pre	J Use erved others using t ⊥ No roceed to #2.	his stream for recreatio dotal Use".		<u>e Hole Arek</u>
III. Witnessee 1.) Have you obs X Yes If yes, pr If no, pro 2.) What kinds of	d Use erved others using t _ No roceed to #2. oceed to, "IV. Aneco uses have you witho	his stream for recreatio dotal Use". essed? Primary Contact Po	n?	
III. Witnessee 1.) Have you obs X Yes If yes, pri If no, pro 2.) What kinds of Fishing	J Use erved others using t No roceed to #2. oceed to, "IV. Aneco uses have you witho Swimming Tub	his stream for recreatio dotal Use". essed? Primary Contact Re- ping Snorkeling S	n? creation ikin Diving	Water Skiing
III. Witnessee 1.) Have you obs X Yes If yes, print If no, pro- 2.) What kinds of Fishing If Interviewee with	d Use erved others using t No roceed to #2. Deceed to, "IV. Anect uses have you with Swimming Tul nessed primary cont	his stream for recreatio dotal Use". essed? Primary Contact Reping Snorkeling S act recreation uses, ask	n? creation Skin Diving	Water Skiing
III. Witnessee 1.) Have you obs X Yes If yes, print If no, pro- 2.) What kinds of Fishing If Interviewee with	d Use erved others using t No roceed to #2. Deceed to, "IV. Anect uses have you with Swimming Tul nessed primary cont	his stream for recreatio dotal Use". essed? Primary Contact Re- ping Snorkeling S act recreation uses, ask ly after a rain?) and ho	n? creation kin Diving : w often (times/yea	Water Skiing
III. Witnessee 1.) Have you obs X Yes If yes, pr If no, pro 2.) What kinds of Fishing If Interviewee with 4.a.) When (e.g., y	d Use erved others using t No roceed to #2. oceed to, "IV. Aneco uses have you without SwimmingTub nessed primary cont ear(s)?; season?; on	his stream for recreatio dotal Use". essed? Primary Contact Re- bing Snorkeling S act recreation uses, ask ly after a rain?) and ho	n? creation :kin Diving : w often (times/yea	Water Skiing
III. Witnessee 1.) Have you obs X Yes If yes, pr If no, pro 2.) What kinds of Fishing If Interviewee with 4.a.) When (e.g., y	d Use erved others using t No roceed to #2. oceed to, "IV. Aneco uses have you without SwimmingTub nessed primary cont ear(s)?; season?; on	his stream for recreatio dotal Use". essed? Primary Contact Re- bing Snorkeling S act recreation uses, ask ly after a rain?) and ho	n? creation :kin Diving : w often (times/yea	Water Skiing

_

11	Interviewee witnessed secondary contact recreation, ask:
4.	e.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? Accupte of the season? (Sood Friday
4.	d.) Where, exactly? Describe specific location and mark on the map. Blue hale 95eq
1.) abo 2.) If Ir	Y. Anecdotal Use Have you heard about anyone using this stream for recreation – not seen or done yourself, but just heard but it? Yes No If yes, proceed to #2. If no, thank the individual for taking the time to talk to you and conclude the interview. What kind of uses have you heard about? Fishing Primary Contact Recreation Swimming Tubing Snorkeling/Skin Diving When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
4.b.)	Where, exactly? Describe specific location and mark on the map
	Secondary Contact Recreation Fishing Wading Boating Trapping Other:
	rviewee (or family) used the stream for secondary contact Recreation, ask: When (e.g., year(s)?; season?; only after a min?) and the secondary contact (i.e. and i.e. and i.e
réa	When (e.g., year(s)?; season?; only after a rain?) and how often (times year)? (carple of is any would go Fishing with Family a church members a Good Fishing

. . .

Can you recommend someone else we could contact that knows the stream? If yes, that person's contact info (name, address, phone, directions?)

Yes No

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments

1.) From the Interviewee:	NA	
2.) From the Interviewer:	NA	

VII. Data Collectors Information

Has interviewer been trained by TCEQ or designee to conduct UAA Interviews? Yes Yes No If yes, how (check all that apply)

Workshop? (if so, enter date): _____

On-line training seminar?

J Followed Interview Instruction Sheets?_____

Other_____

Interviewer Information:

Printed Name: John Branom & JESSE Maya
Employer (where applicable): $PBSAJ$
Interviewer's phone #: 261-529-5100 E-mail: jrbranomapbej.com Signature:

Field Data Sheet for Recreational Use Stream Survey

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Data Sheet	D—Recreational	Use	Interview
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I. Introdu	Name West Fork Mill Creek Segment # UM marned
Date & Time	(include AM or PM): <u>fune 4</u> , <u>3pm</u>
Interviewed:	
Interviewee	pereto for City of Industry
Interviewer	introduction to Interviewee: "My name is, I work for(name of your, and I am collecting information on how people use(name of the stream)
ASK:	
1.) Are you Ye	willing to respond to a survey about this stream? (It will just take a few minutes.) es No If yes, list contact information for the interviewee below: (Do not collect name or contact information if interviewee is a minor)
Legal name:	l_{1} l_{Ra}
Current mailin Daytime phon	ng address: WWTP Operator in City of Industry ne number: ()
Ē-mail addres	s (optional): ν/μ
•	
If yes	ive in this area? Yes No s, how many years? -40473
2.b.) If you do If yes	n't live nearby, are you still familiar with this stream? Yes No
lf no,	thank the individual for taking the time to talk to you and conclude the interview.
landmarks such If yes	miliar with this particular stretch of the stream? (show them the map, pointing out local h as roads, bridges, property lines) Yes No , proceed to "II. Personal Use?" proceed to Section V.
4.) Do you kn	now if it has rained here recently $\chi \gamma$ es No If so, when was the last rainfall May $\partial \delta$
I. Persona	
1.) Have you (Yes	or your family personally used the stream for recreation?
If yes, If no, j	proceed to #3.
.a.) List reasor	is stream not used.
••••••••••••••••••••••••••••••••••••••	
	"III. Witnessed Use?".
) How do you	use the stream? Used to seven and fish best not anymor
of 32	Contract Reprovements A A Drute Destand

Contact Recreation (AA Draft Protocol

Primary Contact Recreation
If Interviewee (or family) used the stream for primary contact recreation, ask:
4.a.) When (e.g., year(s)?: season?; only after a rain?) and how often (times/year)?
years on the summer mostly used is growing up but not any more
up put not any more ()
4.b.) Where, exactly? Describe specific location and mark on the map (See map requirements in
the protocol). Used to find a Blue hole with a for boat. Used to Swin all the time
Secondary Contact Recreation Secondary Contact Recreation Fishing Wading Boating Trapping
If Interviewee (or family) used the stream for secondary contact recreation, ask:
4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
see above
4.d.) Where, exactly? Describe specific location and mark on the map.
III. Witnessed Use
1.) Have you observed others using this stream for recreation? X Yes No
If yes, proceed to #2.
If no, proceed to, "IV. Anecdotal Use".
2.) What kinds of uses have you witnessed?
Primary Contact Recreation XSwimming Tubing Snorkeling/Skin Diving Water Skiing
If Interviewee witnessed primary contact recreation uses, ask:
4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times.year)?
Used to take kido puring in the summer when rain allowed enorgy flow
4.b.) Where, exactly? Describe specific location and mark on the map
Blue hole was mentioned for filining

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Secondary Contact Recreation
If Interviewee witnessed secondary contact recreation, ask:
4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
4.d.) Where, exactly? Describe specific location and mark on the map
IV. Anecdotal Use Have you heard about anyone using this stream for recreation – not seen or done yourself, but just heard about it? Yes No If yes, proceed to #2. If no, thank the individual for taking the time to talk to you and conclude the interview. What kind of uses have you heard about?
Primary Contact Recreation
Swimming Aubing Snorkeling Skin Diving Water Skiing
If Interviewee has heard about primary contact recreation, ask:
4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times year)? under flow allows, especially dur sur mer
4.b.) Where, exactly? Describe specific location and mark on the map where, we heard of kinds tubing but not some where, must be down stream.
Secondary Contact Recreation
If Interviewee (or family) used the stream for secondary contact Recreation, ask:
4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times year)?
4.d.) Where, exactly? Describe specific location and mark on the map.

* ^,

Can you recommend someone else we could contact that knows the stream? If yes, that person's contact info (name, address, phone, directions?)	Mr.	Marek

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments

L) From the Interviewee:
2.) From the Interviewer:

VII. Data Collectors Information

Has interviewer been trained by TCEQ or designee to conduct UAA Interviews?	Ves	No
If yes, how (check all that apply)		110

Workshop? (if so, enter date):

On-line training seminar?

Followed Interview Instruction Sheets?_____

≪Other	raft	protocol	
	0		

Interviewer Information:

Printed Name: Marisa	Weber	2 Casey	Hardin
Employer (where applicable):	BSJ	0	
Interviewer's phone #:231 463	5102	E-mail: mrwebe	- apb31. com
Signature: Mon Mu			

Field Data Sheet for Recreational Use Stream Survey

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Data Sheet D—Recreational Use Interview
Stream Name Mill Creek (West-fork) Segment # unnamed
I. Introduction
Date & Time (include AM or PM): <u>fune 4, 2007</u> 4pm
Interviewed: In person By phone By mail (NOTE: If you are an Interviewee filling out this form to mail back to the TCEQ, proceed to Question #1.)
Interviewee selected because (e.g., house next to stream; standing by stream, etc.) Driving by an access point on blest fork Mill Check
Interviewer introduction to Interviewee: "My name is, I work for(name of your employer), and I am collecting information on how people use(name of the stream)
ASK: 1.) Are you willing to respond to a survey about this stream? (It will just take a few minutes.) Yes No If yes, list contact information for the interviewee below: (Do not collect name or contact information if interviewee is a minor)
Legal name: Mr. Marek Current mailing address: near entersection of mill Creek & Pilcik Ra Daytime phone number: () N/A
E-mail address (optional):
2.a.) Do you live in this area? Yes No If yes, how many years? Yes Yrs
2.b.) If you don't live nearby, are you still familiar with this stream? Yes No If yes, how many years?
If no, thank the individual for taking the time to talk to you and conclude the interview.
 3.) Are you familiar with this particular stretch of the stream? (show them the map, pointing out local landmarks such as roads, bridges, property lines) XYes No If yes, proceed to "II. Personal Use?" If no, proceed to Section V.
4.) Do you know if it has rained here recently V yes No If so, when was the last rainfall May 28
11. Personal Use
 Have you or your family personally used the stream for recreation? Yes No If yes, proceed to #3. If no, proceed to #2.
2.a.) List reasons stream not used.
2.b.) Proceed to "III. Witnessed Use?",
3.) How do you use the stream? Used to fish @ Blue loke, swin all over 27 of 32 but now the creek is sulted Contact Recreation U.A. Draft Protocol

Primary Contact Recreation Swimming Tubing Snorkeling, Skin Diving Water Skiing If Interviewee (or family) used the stream for primary contact recreation, ask: 4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? During west years in the upper reach 4.b.) Where, exactly? Describe specific location and mark on the map (See map requirements in the protocol). all over the upper reaches now. **Secondary Contact Recreation** Fishing XWading Boating Trapping Other: If Interviewee (or family) used the stream for secondary contact recreation, ask: 4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times year)?_____ during wet years 4.d.) Where, exactly? Describe specific location and mark on the map. all over especially Bluehole but not used so much these days. III. Witnessed Use 1.) Have you observed others using this stream for recreation? VYes i No If yes, proceed to #2. If no, proceed to, "IV. Anecdotal Use". 2.) What kinds of uses have you witnessed? **Primary Contact Recreation** Swimming Tubing Snorkeling/Skin Diving Water Skiing If Interviewee witnessed primary contact recreation uses, ask: 4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times year)? anz time flows allowed 4.b.) Where, exactly? Describe specific location and mark on the map. D Huy 109 2 West mill Creek If Interviewee witnessed secondary contact recreation, ask:

*

4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? Only isobe
Sone summer during other Aosd
so bad you can't use most road
4.d.) Where, exactly? Describe specific location and mark on the map.
at Bluehole mostly
IV. Anecdotal Use
1.) Have you heard about anyone using this stream for recreation – not seen or done yourself, but just heard about it?
about it? Yes No
If yes, proceed to #2. If no, thank the individual for taking the time to talk to you and conclude the interview.
2.) What kind of uses have you heard about? Fishing, wade fishing, Swimmin
Primary Contact Recreation
λ Swimming Tubing Snorkeling Skin Diving Water Skiing
If Interviewee has heard about primary contact recreation, ask:
(1, 2) When $(2, 2)$ upper (2) appear (2) and (2) and (2) and (2) and (2) and (2)
4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
4.b.) Where, exactly? Describe specific location and mark on the map
see above info
·
Secondary Contact Recreation
Fishing Wading Boating Trapping Other:
f Interviewee (or family) used the stream for secondary contact Recreation, ask:
4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times year)?
See above info
I.d.) Where, exactly? Describe specific location and mark on the map.
See above info

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Can you recommend someone else we could contact that knows the stream? If yes, that person's contact info (name, address, phone, directions?)	Yes	XNo	

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments 1.) From the Interviewee: <u>Creek is too silty used to be deeper</u> this needs to be fixed
2.) From the Interviewer: Very enformative about the area Lined here is whole life
VII. Data Collectors Information Has interviewer been trained by TCEQ or designee to conduct UAA Interviews? If yes, how (check all that apply)
Workshop? (if so, enter date):
On-line training seminar?
Followed Interview Instruction Sheets?
vother Draft Photocols May 2007
Interviewer Information:

Printed Name: Marisa Weber
Employer (where applicable): PBS J
Interviewer's phone #281493-5100 E-mail: Mrweber @pb51.con
Signature: Man

Field	Data	Sheet	for	Recreational	Use	Stream	Survey
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	Data Sheet D-Recreational Use Interview
5	Stream Name Mill Cveelc Segment #
I.]	Introduction
Dat	te & Time (include AM or PM):
	erviewed: 11 In person 12 By phone 13 By mail DTE: If you are an Interviewee filling out this form to mail back to the TCEQ, proceed to Question #1.)
Inte	crviewee selected because (c.g., house next to stream; standing by stream, etc.) Has used
Inte	erviewer introduction to Interviewee: "My name is, I work for(name of your ployer), and I am collecting information on how people use(name of the stream)
ASI 1.)	K: Are you willing to respond to a survey about this stream? (It will just take a few minutes.) Yes I No If yes, list contact information for the interviewee below: (Do not collect name or contact information if interviewee is a minor)
Curi	al name: Leigh An Schultz rent mailing address: <u>POBX (D-18)</u> Bellulli: 14-770118 time phone number: (576)_065-3127
Ĕ-m	ail address (optional): 15 chulte @ belluliess (optional):
: 2.a.)	Do you live in this area? X Yes No If yes, how many years?
2.b.)	If you don't live nearby, are you still familiar with this stream? 19 Yes 19 No If yes, how many years?
	If no, thank the individual for taking the time to talk to you and conclude the interview.
3.) A landr	Are you familiar with this particular stretch of the stream? (show them the map, pointing out local marks such as roads, bridges, property lines) XYes (1) No If yes, proceed to "II. Personal Use?" If no, proceed to Section V.
4.)	Do you know if it has rained here recently XYes 12 No If so, when was the last rainfall
II.	Personal Use
I.) ł	Have you or your family personally used the stream for recreation? XYes 12 No If yes, proceed to #3. If no, proceed to #2.
2.a.) I	List reasons stream not used.
	Proceed to "III. Witnessed Use?".
5.) Ho	ow do you use the stream? <u>Boating</u>

Primary Contact Recreation

Swimming ... Tubing ... Snorkeling/Skin Diving Water Skiing If Interviewee (or family) used the stream for primary contact recreation, ask: 4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?_____ ____ 4.b.) Where, exactly? Describe specific location and mark on the map (See map requirements in the protocol)._____ Secondary Contact Recreation Fishing & Wading Boating Drapping Other: If Interviewee (or family) used the stream for secondary contact recreation, ask: 4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?_____ Dring and 4.d.) Where, exactly? Rescribe specific location and mark on the map.____ Mill Creek Road to Highwar ----III. Witnessed Use 1.) Have you observed others using this stream for recreation? XYes 👘 No If yes, proceed to #2. If no, proceed to, "IV. Anecdotal Use". 2.) What kinds of uses have you witnessed?

Primary Contact Recreation

2. Swimming 2. Tubing 2. Snorkeling/Skin Diving 2. Water Skiing

If Interviewee witnessed primary contact recreation uses, ask:

4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?_____

4.b.) Where, exactly? Describe specific location and mark on the map._____

Secondary Contact Recreation Wading X Boaring Trapping Other: If Interviewce witnessed secondary contact recreation, ask: 4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? SÐ 20. 4.d.) Where, exactly? Describe specific location and mark on the map. Gamma Grass bridge IV. Anecdotal Use 1.) Have you heard about anyone using this stream for recreation - not seen or done yourself, but just heard about it? XYes d No If yes, proceed to #2. If no, thank the individual for taking the time to talk to you and conclude the interview. 2.) What kind of uses have you heard about? Primary Contact Recreation 2 Swimming 2 Tubing 3 Snorkeling/Skin Diving U Water Skiing If Interviewee has heard about primary contact recreation, ask: 4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?_____ 4.b.) Where, exactly? Describe specific location and mark on the map_____ Secondary Contact Recreation Fishing Wading Boating Trapping Other: If Interviewee (or family) used the stream for secondary contact Recreation, ask: 4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? 4.d.) Where, exactly? Describe specific location and mark on the map._____ Game Gress bridge

V. Others to Contact_____

Can you recommend someone else we could contact that knows the stream? See Yes See A. N. If yes, that person's contact info (name, address, phone, directions?)	lo

If no, thank the individual for taking the time to talk to you and conclude the interview,

VI. Additional Comments

1.) From the Interviewee: _____

	•••••	
2.) From the Interviewer:		
VII. Data Collectors Information	_	
Has interviewer been trained by TCEQ or designce to conduct UAA Interviews? If yes, how (check all that apply)	al Yes	e No
Workshop? (if so, enter date):		
On-line training seminar?		
J Followed Interview Instruction Sheets?		
! Other		_
Interviewer Information:		
Printed Name:		
Employer (where applicable):		
nterviewer's phone #:E-mail:		
Signature:		

. (

Data Sheet D—Recreational Use Interview
Stream Name Mill CREEK Segment #
I. Introduction
Date & Time (include AM or PM): MAY 24, 2007 PM
Interviewed: X In person By phone By mail (NOTE: If you are an Interviewee filling out this form to mail back to the TCEQ, proceed to Question #1.)
Interviewee selected because (e.g., house next to stream; standing by stream, etc.) Contact <u>MET @ SKALAK Rd BRIDGE - WFORK ON HIS WAY FISHING</u> - POND, PLOPERTY OWNER - LEFT BANK & UPSTREAM OF BRIDGE, Interviewer introduction to Interviewee: "My name is, I work for _(name of your employer), and I am collecting information on how people use _(name of the stream)
ASK: 1.) Are you willing to respond to a survey about this stream? (It will just take a few minutes.) Yes No If yes, list contact information for the interviewee below: (Do not collect name or contact information if interviewee is a minor)
Legal name: <u>COB A BBOTT</u> Current mailing address: Daytime phone number: (281) 404 2682
E-mail address (optional):
2.a.) Do you live in this area? Yes XNo If yes, how many years? 2nd Home >12 Grs
2.b.) If you don't live nearby, are you still familiar with this stream? XYes No If yes, how many years?
If no, thank the individual for taking the time to talk to you and conclude the interview.
 3.) Are you familiar with this particular stretch of the stream? (show them the map, pointing out local landmarks such as roads, bridges, property lines) If yes, proceed to "II. Personal Use?" If no, proceed to Section V.
4.) Do you know if it has rained here recently Yes No If so, when was the last rainfall Z DAYS PRIOR
II. Personal Use
 1.) Have you or your family personally used the stream for recreation? Yes X No If yes, proceed to #3. If no, proceed to #2.
2.a.) List reasons stream not used. POOR FISHING IN THAT SPECIFIC WFORK REACH, BETTER FISHING ON LOCAL PONDS. STREEM TOO SMALL FOR CANDE USE @ LOCATION.
2.b.) Proceed to "III. Witnessed Use?"
3.) How do you use the stream? His PROPERTY LINE - SOME CAME. 27 of 32 Contact Recreation UAA Draft Protocol

Contact Recreation UAA Draft Protocol

Primary Contact Recreation Swimming Tubing Snorkeling/Skin Diving Water Skiing If Interviewee (or family) used the stream for primary contact recreation, ask: 4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? 4.b.) Where, exactly? Describe specific location and mark on the map (See map requirements in the protocol). - C OTHER LOCATION Secondary Contact Recreation **X**Fishing Wading Soating Trapping Other: If Interviewee (or family) used the stream for secondary contact recreation, ask: 4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? USES THE STREAM BELOW THE OF E+W ONFUEN Δ FEW TIMES 4.d.) Where, exactly? Describe specific location and mark on the map. DOWNSTREAM OF MINCREEK Rd BRIDGE. III. Witnessed Use 1.) Have you observed others using this stream for recreation? X Yes l No If yes, proceed to #2. If no, proceed to, "IV. Anecdotal Use". 2.) What kinds of uses have you witnessed? Primary Contact Recreation Swimming Subing Snorkeling/Skin Diving Water Skiing If Interviewee witnessed primary contact recreation uses, ask: 4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? LIDS PLAYING 4.b.) Where, exactly? Describe specific location and mark on the map. D/S OF Miu MEEK Rd. BRIDGE.

Secondary Contact Recreation X Fishing Wading Boating Trapping Other: If Interviewee witnessed secondary contact recreation, ask: 4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? RING SUMMER . DIS OF MILLCREEK 0406 4.d.) Where, exactly? Describe specific location and mark on the map. IV. Anecdotal Use 1.) Have you heard about anyone using this stream for recreation - not seen or done yourself, but just heard about it? Yes 1 No If yes, proceed to #2. If no, thank the individual for taking the time to talk to you and conclude the interview. FISHING TUBING 2.) What kind of uses have you heard about? Swimming Frimary Contact Recreation Subing Shorkeling/Skin Diving Water Skiing If Interviewee has heard about primary contact recreation, ask: 4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?_____ sh simmer 4.b.) Where, exactly? Describe specific location and mark on the mar DS OF WW CHEEK VQ. **Secondary Contact Recreation** Fishing Wading Doating Trapping Other: If Interviewee (or family) used the stream for secondary contact Recreation, ask: 4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? 4.d.) Where, exactly? Describe specific location and mark on the map.

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Can you recommend someone else we could contact that knows the stream? Yes No
If yes, that person's contact info (name, address, phone, directions?) SAID TO PHONE Him, HE FNOW A LOT OF
LOCAL LANDDUNERS
If no, thank the individual for taking the time to talk to you and conclude the interview.
VI. Additional Comments
1.) From the Interviewer: hantes - glad to see
you are wearing a PBSJ t-shirt,
2.) From the Interviewer 100 BET Call me l. hus the Environmental Guy & Conoco PHIMIPS until drecently refuted.
VII. Data Collectors Information
Has interviewer been trained by TCEQ or designee to conduct UAA Interviews? If yes, how (check all that apply)
Workshop? (if so, enter date):
On-line training seminar?
Followed Interview Instruction Sheets?
Other
Interviewer Information:
Printed Name:
Employer (where applicable): PBS4J
Interviewer's phone #: 7133035267 E-mail: KCHARDINE PBSJ, com
Signature:
All tolton

Data Sheet D—Recreational Use Interview
Stream Name Min CREEK Segment #
I. Introduction
Date & Time (include AM or PM): MAY 27, 2007 PM
Interviewed: In person By phone By mail (NOTE: If you are an Interviewee filling out this form to mail back to the TCEQ, proceed to Question #1.)
Interviewee selected because (e.g., house next to stream; standing by stream, etc.) HE IS A DEPUTY WITH SHERIFFL DPT.
Interviewer introduction to Interviewee: "My name is, I work for(name of your employer), and I am collecting information on how people use(name of the stream)
ASK: 1.) Are you willing to respond to a survey about this stream? (It will just take a few minutes.) Yes + No = If yes, list contact information for the interviewee below: (Do not collect name or contact information if interviewee is a minor)
Legal name: DEPUTY BRANDON JACK SON Current mailing address:
Current mailing address: Daytime phone number: (99) 865 8905 ¥ 3111
E-mail address (optional):: : 2.a.) Do you live in this area? Yes No DW Ast If yes, how many years?
2.b.) If you don't live nearby, are you still familiar with this stream? Xyes No If yes, how many years?
If no, thank the individual for taking the time to talk to you and conclude the interview.
 3.) Are you familiar with this particular stretch of the stream? (show them the map, pointing out local landmarks such as roads, bridges, property lines) If yes, proceed to "II. Personal Use?" If no, proceed to Section V.
4.) Do you know if it has rained here recently Yes No If so, when was the last rainfall TODA
II. Personal Use
 Have you or your family personally used the stream for recreation? Yes No
If yes, proceed to #3. If no, proceed to #2.
2.a.) List reasons stream not used. OHER PURCES TO GO.
2.b.) Proceed to "III. Witnessed Use?".
3.) How do you use the stream?

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Prinary Contact Recreation
Swimming Tubing
If Interviewee (or family) used the stream for primary contact recreation, ask:
4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
4.b.) Where, exactly? Describe specific location and mark on the map (See map requirements in the protocol).
Secondary Contact Recreation Fishing Wading Boating Trapping Other:
If Interviewee (or family) used the stream for secondary contact recreation, ask:
4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
4.d.) Where, exactly? Describe specific location and mark on the map
III. Witnessed Use 1.) Have your observed others using this stream for recreation? Yes No
If yes, proceed to #2. If no, proceed to, "IV. Anecdotal Use".
2.) What kinds of uses have you witnessed?
Primary Contact Recreation Swimming Tubing Snorkeling/Skin Diving Water Skiing
f Interviewee witnessed primary contact recreation uses, ask:
t.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
SUMMER > KiDS OUTTA SCHOOL
h.b.) Where, exactly? Describe specific location and mark on the map DOWN STREAM OF WiwCorrey PQ

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Secondary Contact Recreation Fishing Wading Boating Trapping Other:

If Interviewee witnessed secondary contact recreation, ask:

4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?

4.d.) Where, exactly? Describe specific location and mark on the map.

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IV. Anecdotal Use

1.) Have you heard about anyone using this stream for recreation - not seen or done yourself, but just heard about it?

Yes - No

If yes, proceed to #2.

If no, thank the individual for taking the time to talk to you and conclude the interview.

FISHIN' & TUBI 2.) What kind of uses have you heard about?

Swimming Vibing Shorkeling Skin Diving

Water Skiing

If Interviewee has heard about primary contact recreation, ask:

4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?

4.b.) Where, exactly? Describe specific location and mark on the map

Fishing Wading Secondary Contact Recreation Wading Boating Trapping (Other:

If Interviewee (or family) used the stream for secondary contact Recreation, ask:

4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?

4.d.) Where, exactly? Describe specific location and mark on the map.

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Can you recommend someone else we could contact that knows the stream? Yes If yes, that person's contact info (name, address, phone, directions?)_

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments 1.) From the Interviewee:
2.) From the Interviewer:
VII. Data Collectors Information Has interviewer been trained by TCEQ or designee to conduct UAA Interviews? No If yes, how (check all that apply)
Workshop? (if so, enter date): On-line training seminar?
Followed Interview Instruction Sheets? Other
Interviewer Information: Printed Name: KCKSEY HARDIN Employer (where applicable): PBS+J
Interviewer's phone #: 713 303 5267 E-mail: KCHARDINC PBSJ.com Signature: KCHARDINC PBSJ.com 8.7.07

NASK

| No

Field Data Sheet for Recreational Use Stream Survey

	Data Sheet D_Recreational Use Interview Stream Name Mill Creek Segment #
1	I. Introduction
E	Date & Time (include AM or PM):
I1 (1	nterviewed: In person By phone By mail NOTE: If you are an Interviewee filling out this form to mail back to the TCEQ, proceed to Question #1.
[1	nterviewee selected because (e.g., house next to stream; standing by stream, etc.)
Ir	nterviewer introduction to Interviewee: "My name is, I work for(name of your nployer), and I am collecting information on how people use(name of the stream)
A	SK:) Are you willing to respond to a survey about this stream? (It will just take a few minutes.) Use Ves Vo If yes, list contact information for the interviewee below: (Do not collect name or contact information if interviewee is a minor)
Cu	gal name: Charl Sweatingen urrent mailing address: 3907 Quart Cirk Sent 77474
Ē-r	mail address (optional):
: 2.a	.) Do you live in this area? If yes, how many years? Yes No
2.b.) If you don't live nearby, are you still familiar with this stream? If yes, how many years?
	If no, thank the individual for taking the time to talk to you and conclude the interview.
3.) land	Are you familiar with this particular stretch of the stream? (show them the map, pointing out local marks such as roads, bridges, property lines) (Yes) (No If yes, proceed to "II. Personal Use?" If no, proceed to Section V.
4.)	Do you know if it has rained here recently (Yes) No If so, when was the last rainfall
II.	Personal Use
1.) I	Have you or your family personally used the stream for recreation? Yes No If yes, proceed to #3. If no, proceed to #2.
2.a.) [List reasons stream not used.
	Proceed to "III. Witnessed Use?".

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	Swimming Tub	Primary Contact Recreations Snorkeling/Skin D	on iving Water Skiing	
If Interviewee	or family) used the stre	am for primary contact recre		
		ly after a rain?) and how ofte		
	Ina sent y	yet in years	· p	Leense
		7000	- used as a	Junite
4.b.) Where, ex the protocol).	actly? Describe specific	location and mark on the m	ap (See map requirements in	1
	[ndus	ty E buy	36	
	U			
- F	se ishing : Wading	condary Contact Recreati Boating Trapping	on Other:	
If Interviewee (c	r family) used the strea	m for secondary contact recr		
		after a rain?) and how often		
	Titalist	Pout ((times/year)?	
	1 12000-	(David) Ju	10	
III. Witnessec 1.) Have you obso (Yes)	Use rved others using this st			
1.) Have you obse Yes If yes, pr	rved others using this s	tream for recreation?		
1.) Have you obse Yes If yes, pr If no, pro	rved others using this si No poceed to #2.	tream for recreation?		
 Have you observed in the second second	rved others using this si No Deceed to #2. Ceed to, "IV. Anecdotal uses have you witnessed	tream for recreation?		
 Have you observed in the second second	rved others using this si No Deceed to #2. Ceed to, "IV. Anecdotal uses have you witnessed Prin Swimming Tubing	tream for recreation? Use". I? mary Contact Recreation Snorkeling/Skin Divin		
 Have you observed in the second second	rved others using this si No Deceed to #2. ceed to, "IV. Anecdotal uses have you witnessed Prin Swimming Tubing essed primary contact re	tream for recreation? Use". i? mary Contact Recreation Snorkeling/Skin Divin ecreation uses, ask:	g . Water Skiing	
 Have you observed in the second second	rved others using this si No Deceed to #2. ceed to, "IV. Anecdotal uses have you witnessed Prin Swimming Tubing essed primary contact re	tream for recreation? Use". I? mary Contact Recreation Snorkeling/Skin Divin ecreation uses, ask: ter a rain?) and how often (ti	g Water Skiing mes/year)?	
 Have you observed in the second second	rved others using this si No Deceed to #2. ceed to, "IV. Anecdotal uses have you witnessed Prin Swimming Tubing essed primary contact re	tream for recreation? Use". I? mary Contact Recreation Snorkeling/Skin Divin ecreation uses, ask: ter a rain?) and how often (ti	g Water Skiing mes/year)?	
 Have you observed. Yes If yes, prif no, pro What kinds of the served served served served served. If Interviewee with 4.a.) When (e.g., yes 	rved others using this si No Deceed to #2. Ceed to, "IV. Anecdotal Uses have you witnessed Swimming Tubing essed primary contact re ar(s)?; season?; only af	tream for recreation? Use". I? mary Contact Recreation Snorkeling/Skin Divin ecreation uses, ask: ter a rain?) and how often (ti	g Water Skiing mes/year)?	

1

	Fishing Wading	Secondary Con Boating	act Recreation	0n
	0 000	5		
	ee witnessed secondary co			
4.c.) When	e.g., year(s)?; season?; on	ly after a rain?) a	and how often	(times/year)?
4.d.) Where,	exactly? Describe specific	c location and m	urk on the mai	p
······				
· · · · · · · · · · · · · · · · · · ·				
IV. Anecd	otal Use			
1.) Have you about it?	heard about anyone using	this stream for r	ecreation – no	ot seen or done yourself, but just hear
⊴ Y				
Ifve	s, proceed to #2.			
If no	, thank the individual for t	aking the time to	talk to you a	nd conclude the interview.
2.) What kind	of uses have you heard at	iout?	und to you u	nd conclude the interview.
,				
	P Swimming Tubin	rimary Contact	Recreation	g Water Skiing
If Interviewee	-			g water Skiing
	has heard about primary c			
4.a.) When (e.	g., year(s)?; season?; only	after a rain?) and	how often (t	imes/year)?
4.b.) Where, ex	actly? Describe specific lo	ocation and mark	on the map	
_ F	ishing Wading	ndary Contact Boating		har
If Interviewee (a		U I		her:
	r family) used the stream			
4.c.) When (e.g.	year(s)?; season?; only af	ter a rain?) and h	ow often (tim	les/year)?
4.d.) Where, exac	tly? Describe specific loca	ntion and mark o	n the map.	

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Can you recommend someone else we could contact that knows the stream?		
our you recommend someone else we could contact that knows the stream?	17	
If you that it is a second of the knows the stream?	Yes	- No
If yes, that person's contact info (name, address, phone, directions?)		
rections?)		

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments

1.) From the Interviewee:

3) m	
2.) From the Interviewer:	

VII. Data Collectors Information

Has interviewer been trained by TCEQ or designed If yes, how (check all that apply)	e to conduct UAA Interviews?	2 Yes	- No
Workshop? (if so, enter date):			
On-line training seminar?			
Followed Interview Instruction Sheets?			
Other			
Interviewer Information:			-
Printed Name:			
Employer (where applicable):			
Interviewer's phone #:	E-mail:		
Signature:			-

Field Data Sheet for Recreational Use Stream Survey

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Stre	am Name Mill Creek - Ausdin Co. Segment #
	oduction
Date &	Time (include AM or PM):
Interviev	
Intervie	wee selected because (e.g., house next to stream; standing by stream, etc.)
Intervie employe "	wer introduction to Interviewee: "My name is, I work for(name of your r), and I am collecting information on how people use(name of the stream)
	you willing to respond to a survey about this stream? (It will just take a few minutes.) Yes Vo If yes, list contact information for the interviewee below: (Do not collect name or contact information if interviewee is a minor)
	ne: <u>Frank Monk</u> nailing address: <u>12168 Schaffner Pol Sealy</u> TX 77474 phone number: (929) <u>865-3558</u>
E-mail ad	dress (optional):i Frank mont @ yahao . com
2.a.) Do y It	ou live in this area? Yes No f yes, how many years? 27 yrs
2.b.) If you	u don't live nearby, are you still familiar with this stream? 12 Yes No
If	no, thank the individual for taking the time to talk to you and conclude the interview.
3.) Are yo landmarks If	u familiar with this particular stretch of the stream? (show them the map, pointing out local such as roads, bridges, property lines) yes, proceed to "II. Personal Use?" no, proceed to Section V.
4.) Do you	know if it has rained here recently Yes No If so, when was the last rainfall
II. Perso	
IF.	ou or your family personally used the stream for recreation? Yes, proceed to #3. w, proceed to #2.
11 11	sons stream not used.

	Primary Contact Recreation Swimming Tubing Snorkeling/Skin Diving Water Skiing
If	Interviewee (or family) used the stream for primary contact recreation, ask:
	a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? fhrou, how there is a liftle rise
4.b the	p.) Where, exactly? Describe specific location and mark on the map (See map requirements in protocol)
	between Oll mill arch that of FM2429
	Secondary Contact Recreation Fishing Wading Boating Trapping Other:
	nterviewee (or family) used the stream for secondary contact recreation, ask:
4.c .)) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
	see 4.a.
4.d.)) Where, exactly? Describe specific location and mark on the map
	Sec 4.6.
	Witnessed Use lave you observed others using this stream for recreation?
	If yes, proceed to #2. If no, proceed to, "IV. Anecdotal Use".
2.) W	hat kinds of uses have you witnessed?
	Primary Contact Recreation Swimming Tubing Snorkeling/Skin Diving Water Skiing
If Inter	rviewee witnessed primary contact recreation uses, ask:
4.a.) W	When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
	peciolically during just
4.b.) W	/here exactly? Describe and the traction of the second sec
,	/here, exactly? Describe specific location and mark on the map

Secondary Contact Recreation Fishing -Wading Boating Trapping Other: If Interviewee witnessed secondary contact recreation, ask: 4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?___ orfer vise relis yrac 4.d.) Where, exactly? Describe specific location and mark on the map.___ beart 2429 dl Mill Greek Builge **IV. Anecdotal Use** 1.) Have you heard about anyone using this stream for recreation - not seen or done yourself, but just heard Yes : No If yes, proceed to #2. If no, thank the individual for taking the time to talk to you and conclude the interview. 2.) What kind of uses have you heard about? abilitats **Primary Contact Recreation** Swimming . Tubing Snorkeling/Skin Diving U Water Skiing If Interviewee has heard about primary contact recreation, ask: 4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?_____ 4.b.) Where, exactly? Describe specific location and mark on the map_____ Secondary Contact Recreation **Fishing** - Wading - Boating Trapping Other: _____ If Interviewee (or family) used the stream for secondary contact Recreation, ask: 4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?_____ 4.d.) Where, exactly? Describe specific location and mark on the map. _____

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Can you recommend someone else we could contact that knows the st	D			
If you that you it is the total contact that knows the st	rream?	Yes	No	
If yes, that person's contact info (name, address, phone, direct	ationall			
(interview address, phone, uneq	cuons()			

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments

1.) From the Interviewee:

	Solure	win	the	Creek	Rave	frage	ŧ a	mes
	leve				······································		1	
2) From the Inter-								
2.) From the Interview	er:							

VII. Data Collectors Information

Has interviewer been trained by TCEQ or designee to conc If yes, how (check all that apply)	luct UAA Interviews?	- Yes	L No
Workshop? (if so, enter date):			
On-line training seminar?			
Followed Interview Instruction Sheets?			
Other			
Interviewer Information:			-
Printed Name:			
Employer (where applicable):			_
Interviewer's phone #:E-mail:			
Signature:			_
			_

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	Stream Name Creek Segment #
	I. Introduction
	Date & Time (include AM or PM):
	Interviewed: In person By phone By mail (NOTE: If you are an Interviewee filling out this form to mail back to the TCEQ, proceed to Question #1.)
	Interviewee selected because (e.g., house next to stream; standing by stream, etc.)
	Interviewer introduction to Interviewee: "My name is, I work for(name of your employer), and I am collecting information on how people use(name of the stream)
	ASK: 1.) Are you willing to respond to a survey about this stream? (It will just take a few minutes.) Yes I No If yes, list contact information for the interviewee below: (Do not collect name or contact information is in the interviewee below:
. (Legal name: W Tommy MoNK Current mailing address: P . G . 322 Bellwille $7X$ 77418 Daytime phone number: (975) 877-4335
Ē	E-mail address (optional): WTMONKG EMail. com
•	a.) Do you live in this area? Yes No If yes, how many years? 15
2	.b.) If you don't live nearby, are you still familiar with this stream? If yes, how many years?
	If no, thank the individual for taking the time to talk to you and conclude the interview.
3. Ia) Are you familiar with this particular stretch of the stream? (show them the map, pointing out local ndmarks such as roads, bridges, property lines) Yes No If yes, proceed to "II. Personal Use?" If no, proceed to Section V.
· 4.)	
II	Do you know it it has rained here recently Yes No If so, when was the last rainfall
	Have you or your family personally used the stream for recreation?
	If yes, proceed to #3. If no, proceed to #2.
2.a.) List reasons stream not used.
. b .	Proceed to "III. Witnessed Use?". Now do you use the stream? F. Shing Canoe handing

Contact Recreation UAA Draft Protocol

If Interviewee (or family) used the stream for primary contact recreation, ask:

4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?__

nes F 1982 trom

4.b.) Where, exactly? Describe specific location and mark on the map (See map requirements in the protocol).

2am Ma

Secondary Contact Recreation Fishing U Wading Boating

Fishing Wading Boating Trapping Other:

If Interviewee (or family) used the stream for secondary contact recreation, ask:

4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?

preser

4.d.) Where, exactly? Describe specific location and mark on the map._

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III. Witnessed Use

1.) Have you observed others using this stream for recreation?

If yes, proceed to #2. If no, proceed to, "IV. Anecdotal Use".

2.) What kinds of uses have you witnessed?

Swimming

Primary Contact Recreation Tubing Snorkeling Skin Diving

. Water Skiing

If Interviewee witnessed primary contact recreation uses, ask:

4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?_____

4.b.) Where, exactly? Describe specific location and mark on the map._____

Secondary Contact Recreation Wading Boating Trapping Other:

If Interviewee witnessed secondary contact recreation, ask:

Fishing

4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?____

durch at

4.d.) Where, exactly? Describe specific location and mark on the map.

11/ A-A 1 60 ecte

IV. Anecdotal Use

1.) Have you heard about anyone using this stream for recreation – not seen or done yourself, but just heard about it?

Yes No

If yes, proceed to #2.

If no, thank the individual for taking the time to talk to you and conclude the interview.

2.) What kind of uses have you heard about?

Swimming

Primary Contact Recreation ing ______ Tubing _____ Snorkeling/Skin Diving

Arrow Heards

If Interviewee has heard about primary contact recreation, ask:

4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?____

4.b.) Where, exactly? Describe specific location and mark on the map____

Secondary Contact Recreation

Fishing Wading

Boating Trapping Other:

If Interviewee (or family) used the stream for secondary contact Recreation, ask:

4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?_____

4.d.) Where, exactly? Describe specific location and mark on the map.

V. Others to Contact

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Can you recommend someone else we could contact that knows the stream?	
If yes, that person's contact info (name, address, phone, directions?)	es No
(name, address, phone, directions?)	865-578C
Marine Alto barroom Alt III a	NA I I
Marcus fottenborger @ bellvitte me	A Market

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments 1.) From the Interviewee:

1.) From the interviewee:	
2.) From the Interviewer:	
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VII. Data Collectors Information

Has interviewer been trained by TCEQ or designee to co If yes, how (check all that apply)	nduct UAA Interviews?	· Yes	r_ No
Workshop? (if so, enter date):			
On-line training seminar?			
J Followed Interview Instruction Sheets?			
Other			
Interviewer Information:			-
Printed Name:			
Employer (where applicable):			
Interviewer's phone #:E-mai	l:		
Signature:			-

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Stre	ım Name	Data Sheet D- M, 11 C ree			1ent #	
I. Intr	duction	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		00gm		<u></u>
Date &	lime (include AM	A or PM):				
Interviev	ved: In pers	son By phone rviewee filling out th	By mail		Q, proceed to Oues	tion #1)
		ause (e.g., house nex				
Intervie	ver introduction	to Interviewee: "M collecting informatio	V name is			
ASK: 1.) Are	∕ou willing to res d Yes sel No	pond to a survey abo If yes, list contact in not collect name or	out this stream? (It will just take a	t few minutes.)	
Legal nar Current n Daytime	ailing address:	<u>cci Larson</u> 117 W 12 19) Sis-5:	Phler		vee is a minor)	
E-mail ad	tress (optional):	B-a21529 Q	ad .com			
2.a.) Do y I	ou live in this area yes, how many y	a? Yes years? 12 y r3	U No			
2.b.) If yo	don't live nearb	y, are you still famili ears?		im? 🔄 Yes	No	
If	no, thank the ind	ividual for taking the	time to talk to y	ou and conclude	the interview.	
3.) Are yo landmarks If	a familiar with the such as roads, brid	is particular stretch o dges, property lines) II. Personal Use?"	of the stream? (sl	10W them the me		al
4.) Do you	know if it has ra	ined here recently	Yes No	If so, when was	the last rainfall	1/26/0-
II. Pers						
If	ou or your family (es No es, proceed to #3. o, proceed to #2.	personally used the	stream for recrea	ation?		
2.a.) List rea	sons stream not u	sed				
2.b.) Proceed	to "III. Witnesse	d Use?".				
3.) How do y	ou use the stream	? <u>Cande</u>	ny	and a second a sub-second second second second		

If Interview	Swimming Tubing Snorkeling/Skin Diving Water Skiing
It milerview	ee (or family) used the stream for primary contact recreation, ask:
4.a.) When	(e.g., year(s)?; season?; only after a rain?) and how often (times/year)? 5 + (Mes times of year
	, exactly? Describe specific location and mark on the map (See map requirements in). <u>MII Creck Bridge</u> to Twin Bridges t 205 River
	Secondary Contact Recreation
If Interviewe	ee (or family) used the stream for secondary contact recreation, ask:
4.0.) witch (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
4.d.) Where	
	exactly? Describe specific location and mark on the man
	exactly? Describe specific location and mark on the map
	exactly? Describe specific location and mark on the map.
III. Witnes	sed Use
III. Witnes	sed Use observed others using this stream for recreation?
III. Witnes 1.) Have you	essed Use observed others using this stream for recreation?
III. Witnes 1.) Have you Ye If yes	sed Use observed others using this stream for recreation?
III. Witnes 1.) Have you Ye If yes If no,	sed Use observed others using this stream for recreation? No s, proceed to #2. proceed to, "IV. Anecdotal Use". s of uses have you witnessed?
III. Witnes 1.) Have you Ye If yes If no. 2.) What kinds	ssed Use observed others using this stream for recreation? No s, proceed to #2. proceed to, "IV. Anecdotal Use". s of uses have you witnessed? Primary Contact Recreation
III. Witnes 1.) Have you Ye If yes If no. 2.) What kinds F, 5h ir	ssed Use observed others using this stream for recreation? so No s, proceed to #2. proceed to, "IV. Anecdotal Use". s of uses have you witnessed?
III. Witnes 1.) Have you Ye If yes If no. 2.) What kinds F, 5h ir	ssed Use observed others using this stream for recreation? No s, proceed to #2. proceed to, "IV. Anecdotal Use". s of uses have you witnessed? Primary Contact Recreation
III. Witnes 1.) Have you Ye If yes If no. 2.) What kinds F. Sh. M If Interviewee	ssed Use observed others using this stream for recreation? es No s, proceed to #2. proceed to, "IV. Anecdotal Use". s of uses have you witnessed? Primary Contact Recreation Swimming Tubing Snorkeling Skin Diving Water Skiing witnessed primary contact recreation uses, ask:
III. Witnes 1.) Have you Ye If yes If no. 2.) What kinds F. Sh. M If Interviewee	ssed Use observed others using this stream for recreation? so No s, proceed to #2. proceed to, "IV. Anecdotal Use". s of uses have you witnessed? Primary Contact Recreation Swimming Tubing Snorkeling Skin Diving Water Skiing witnessed primary contact recreation uses, ask:
III. Witnes 1.) Have you $f(x) = \frac{1}{2}$ If yes If no. 2.) What kinds $f(x) = \frac{1}{2}$ If Interviewee 4.a.) When (e.g	sed Use observed others using this stream for recreation? s, proceed to #2. proceed to, "IV. Anecdotal Use". s of uses have you witnessed? Primary Contact Recreation Swimming Tubing Snorkeling Skin Diving Water Skiing witnessed primary contact recreation uses, ask: g, year(s)?; season?; only after a rain?) and how often (times.year)? Call + main and the comparison of the comparis
III. Witnes 1.) Have you $f(x) = \frac{1}{2}$ If yes If no. 2.) What kinds $f(x) = \frac{1}{2}$ If Interviewee 4.a.) When (e.g	ssed Use observed others using this stream for recreation? es No s, proceed to #2. proceed to, "IV. Anecdotal Use". s of uses have you witnessed? Primary Contact Recreation Swimming Tubing Snorkeling Skin Diving Water Skiing witnessed primary contact recreation uses, ask:

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If Int	Fishing Wading Boating Trapping Other:
	erviewee witnessed secondary contact recreation, ask:
4.c.) \	When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
4.d.) \	Where, exactly? Describe specific location and mark on the map
IV. A 1.) Hay about i	Anecdotal Use ve you heard about anyone using this stream for recreation – not seen or done yourself, but just heard it? Yes No
	If yes, proceed to #2. If no, thank the individual for taking the time to talk to you and conclude the interview.
2.) Wh	at kind of uses have you heard about? <u>Swmmns</u>
	Primary Contact Recreation Swimming Tubing Snorkeling/Skin Diving Water Skiing
If Intern	v v dei Skillig
	viewee has heard about primary contact recreation, ask:
4.a.) wi	hen (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? Jummer
4.b.) WI	here, exactly? Describe specific location and mark on the map Bled's Fishing Cump 180013 around Hill Creek Bridge
	Secondary Contact Recreation Fishing Wading Boating Trapping Other:
f Intervi	ewee (or family) used the stream for secondary contact Recreation, ask:
	en (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?

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V. Others to Contact

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		and the second
Can you recommend someone else we could contact that knows the stream? If yes, that person's contact info (name, address, phone, directions?)	Yes	_ No

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments

1.) From the Interviewee:

2.) From the Interviewer:

VII. Data Collectors Information

Has interviewer been trained by TCEQ or designee t If yes, how (check all that apply)	2 Yes	No	
Workshop? (if so, enter date):			
On-line training seminar?	- Anto		
Followed Interview Instruction Sheets?			
Other			
Interviewer Information:			•
Printed Name:			
Employer (where applicable):			
Interviewer's phone #:E	-mail:		
Signature:			-

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	Data Sheet D—Recreational Use Interview
	Stream Name Mill Creek Segment #
	. Introduction
D	Date & Time (include AM or PM): $\gamma 20 07 3.5 PM$
Ir	nterviewed: In person By phone By mail NOTE: If you are an Interviewee filling out this form to mail back to the TCEQ, proceed to Question #1.)
In	COUNTY RESIDEN
In en "	nterviewer introduction to Interviewee: "My name is, I work for(name of your mployer), and I am collecting information on how people use(name of the stream)
AS	SK:) Are you willing to respond to a survey about this stream? (It will just take a few minutes.) (Yes 1.1 No If yes, list contact information for the interviewee below: (Do not collect name or contact information if interviewee is a minor)
Le, Cu Da	igal name: Tray Moses urrent mailing address: <u>685 005 Hurr 366</u> Bewalte 77418 hytime phone number: (971) Bus - 3129
_	mail address (optional):
: 2.a.	.) Do you live in this area? Yes I No If yes, how many years?
2.b.	.) If you don't live nearby, are you still familiar with this stream? Yes No If yes, how many years?
	If no, thank the individual for taking the time to talk to you and conclude the interview.
3.) land	Are you familiar with this particular stretch of the stream? (show them the map, pointing out local lmarks such as roads, bridges, property lines) Yes No If yes, proceed to "II. Personal Use?" If no, proceed to Section V.
4.)	Do you know if it has rained here recently Yes No If so, when was the last rainfall
	Personal Use
1.) H	Have you or your family personally used the stream for recreation? VYes No If yes, proceed to #3. If no, proceed to #2.
2.a.) [List reasons stream not used.
	Proceed to "III. Witnessed Use?".
3.) Ho	w do you use the stream? RECREATIONAL F.SH.NC
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Contact Recreation UAA Draft Protocol

If Interviewee (or family) used the stream for primary contact recreation, ask: 4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times.year)? 4.b.) Where, exactly? Describe specific location and mark on the map (See map requirements in the protocol). Secondary Contact Recreation Jishing Wading Boating Trapping Other:	4.a.) When (e.g., year(s)?; seasor	n?; only after a rain?) and how often (time	ısk: s/year)?
4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times year)? 4.b.) Where, exactly? Describe specific location and mark on the map (See map requirements in the protocol). Secondary Contact Recreation Fishing Wading Secondary contact recreation Water Skiing III. Witnessed Use 1.) Have you observed others using this stream for recreation? Yes No If yes, proceed to #2, If no, proceed to #2, If no, proceed to #2, If no, proceed to #2, If Interviewee witnessed primary contact recreation Swimming Tubing Shorkeling Skin Diving Water Skiing If Interviewee witnessed primary contact recreation uses, ask: 4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times year)?	4.a.) When (e.g., year(s)?; seasor	n?; only after a rain?) and how often (time	s/year)?
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 4.d.) Where, exactly? Describe specific location and mark on the map. <u>2439</u> <u>282.06</u> <u>Then Dotth of Where way</u> III. Witnessed Use Have you observed others using this stream for recreation? Yes	4.c.) When $(e_{\alpha}, vert(a))$: see a^{2}	?; only after a rain?) and how often (times/	year)? ONCE OR
III. Witnessed Use Have you øbserved others using this stream for recreation? YesNo If yes, proceed to #2. If no, proceed to, "IV. Anecdotal Use". What kinds of uses have you witnessed? Primary Contact Recreation Swimming Tubing Snorkeling Skin Diving Water Skiing If Interviewee witnessed primary contact recreation uses, ask: When (e.g., year(s)?; season?; only after a rain?) and how often (times.year)?	4.d.) Where, exactly? Describe spe THEN NORTH ON	ecific location and mark on the map	2429 2 BZIDA
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 4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times year)?	0	ubing Snorkeling Skin Diving	Water Skiing
4.b.) Where, exactly? Describe specific location and mark on the map			
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	specific charge Describe specific	ic location and mark on the map	

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Fishing	Secondary Contact Recreation Wading Boating Trapping Other:
If Interviewee witnessed	secondary contact recreation, ask:
4.c.) When (e.g., year(s)?	; season?; only after a rain?) and how often (times/year)? MONTHLY
4.d.) Where, exactly? Des	cribe specific location and mark on the map. SAME LOCATION
If yes, proceed to	anyone using this stream for recreation – not seen or done yourself, but just heard #2. dividual for taking the time to talk to you and conclude the interview.
	you heard about?
Swimmin If Interviewee has heard abo 4.a.) When (e.g., year(s)?; so	Primary Contact Recreation ng Tubing Snorkeling/Skin Diving Water Skiing but primary contact recreation, ask: eason?; only after a rain?) and how often (times/year)?
.b.) Where, exactly? Descri	be specific location and mark on the map
Fishing W	Secondary Contact Recreation
	d the stream for secondary contact Recreation, ask:
	son?; only after a rain?) and how often (times/year)?
1.) Where, exactly? Describe	specific location and mark on the map.

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V. Others to Contact

Can you recommend someone else we could contact that knows the stream? Yes If yes, that person's contact info (name, address, phone, directions?)

No

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments

1.) From the Interviewee:

2.) From the Interviewer:

VII. Data Collectors Information

Has interviewer been trained by TCEQ or designee to conduct UAA Interviews? If yes, how (check all that apply)

Workshop? (if so, enter date):

On-line training seminar?

J Followed Interview Instruction Sheets?_____

Other____

Interviewer Information:

Printed Name: Tray Moses	>
Employer (where applicable):	
Interviewer's phone #: 979-925	E-mail:
Signature: Tray	

	Data Sheet D—Recreational Use Interview
St	ream Name Mill Creek Segment #
I. In	itroduction
Date	& Time (include AM or PM):
Interv	viewed: In person By phone By mail TE: If you are an Interviewee filling out this form to mail back to the TCEQ, proceed to Question #1.)
	viewee selected because (e.g., house next to stream; standing by stream, etc.)
Interv emplo "	viewer introduction to Interviewee: "My name is, I work for(name of your, and I am collecting information on how people use(name of the stream)
ASK: 1.) A	The you willing to respond to a survey about this stream? (It will just take a few minutes.) Yes I No If yes, list contact information for the interviewee below: (Do not collect name or contact information if interviewee is a minor)
Legal ı Curren Daytin	
E-mail	address (optional):
: 2.a.) Do	o you live in this area? Uses If yes, how many years?
2.b.) If	you don't live nearby, are you still familiar with this stream? I Yes No
	If no, thank the individual for taking the time to talk to you and conclude the interview.
3.) Are landmar	you familiar with this particular stretch of the stream? (show them the map, pointing out local ks such as roads, bridges, property lines) If yes, proceed to "II. Personal Use?" If no, proceed to Section V.
4.) Do <u>:</u>	you know if it has rained here recently ves No If so, when was the last rainfall
	rsonal Use
1	e you or your family personally used the stream for recreation? If yes, proceed to #3. If no, proceed to #2.
	reasons stream not used.
2.b.) Proce	eed to "III. Witnessed Use?".
3.) How de	o you use the stream?
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	Primary Contact Recreation Swimming Tubing Snorkeling/Skin Diving Water Skiing
If Intervie	wee (or family) used the stream for primary contact recreation, ask:
4.a.) When	n (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
	not used since a tenaju
4.b.) Wher the protoco	e, exactly? Describe specific location and mark on the map (See map requirements in b).
	all mill free to the 21
	ght fill the for 126
	Secondary Contact Recreation Fishing Wading Boating Trapping Other:
If Interview	ee (or family) used the stream for secondary contact recreation, ask:
	(e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
	Aghing Backing (in the intersection in the in
4.d.) Where,	exactly? Describe specific location and mark on the map.
III. Witne	ssed Use
III. Witnes	ssed Use observed others using this stream for regreation?
III. Witnes 1.) Have you	observed others using this stream for recreation?
1.) Have you	observed others using this stream for recreation?
1.) Have you	observed others using this stream for recreation?
1.) Have you	observed others using this stream for recreation? es No es, proceed to #2. o, proceed to, "IV. Anecdotal Use".
1.) Have you Y If ye If no	observed others using this stream for recreation? esNo es, proceed to #2. o, proceed to, "IV. Anecdotal Use". s of uses have you witnessed?
1.) Have you Y If ye If no	observed others using this stream for recreation? es No s, proceed to #2. o, proceed to, "IV. Anecdotal Use". s of uses have you witnessed? Primary Contact Recreation
1.) Have you If ye If no 2.) What kind	observed others using this stream for recreation? es No s, proceed to #2. p, proceed to, "IV. Anecdotal Use". s of uses have you witnessed? Primary Contact Recreation Swimming Tubing Snorkeling Skin Diving Water Skiing
1.) Have you If ye If no 2.) What kind If Interviewee	observed others using this stream for recreation? es No s, proceed to #2. p, proceed to, "IV. Anecdotal Use". s of uses have you witnessed? Primary Contact Recreation Swimming Tubing Snorkeling Skin Diving Water Skiing witnessed primary contact recreation uses, ask:
1.) Have you If ye If no 2.) What kind If Interviewee	observed others using this stream for recreation? es No s, proceed to #2. p, proceed to, "IV. Anecdotal Use". s of uses have you witnessed? Primary Contact Recreation Swimming Tubing Snorkeling Skin Diving Water Skiing
 Have you Y If ye If no What kind If Interviewee	observed others using this stream for recreation? es No s, proceed to #2. p, proceed to, "IV. Anecdotal Use". s of uses have you witnessed? Primary Contact Recreation Swimming Tubing Snorkeling Skin Diving Water Skiing witnessed primary contact recreation uses, ask:
1.) Have you If ye If ye If no 2.) What kinds If Interviewee 4.a.) When (e.g	observed others using this stream for recreation? esNo es, proceed to #2. b, proceed to, "IV. Anecdotal Use". s of uses have you witnessed? Primary Contact Recreation SwimmingUbingNote: Stream of the
 Have you If ye If no What kinds If Interviewee 4.a.) When (e.g 	observed others using this stream for recreation? es No s, proceed to #2. p, proceed to, "IV. Anecdotal Use". s of uses have you witnessed? Primary Contact Recreation Swimming Tubing Snorkeling Skin Diving Water Skiing witnessed primary contact recreation uses, ask: g, year(s)?; season?; only after a rain?) and how often (times/year)?

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	Fishing Wading Boating Trapping Other:
	If Interviewee witnessed secondary contact recreation, ask:
	4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
	4.d.) Where, exactly? Describe specific location and mark on the map
ŧ	IV. Anecdotal Use 1.) Have you heard about anyone using this stream for recreation – not seen or done yourself, but just heard about it?
	If yes, proceed to #2. If no, thank the individual for taking the time to talk to you and conclude the interview.
2	.) What kind of uses have you heard about?
	Primary Contact Recreation Swimming Tubing Snorkeling/Skin Diving Water Skiing Interviewee has heard about primary contact recreation, ask: a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
4.b	b.) Where, exactly? Describe specific location and mark on the map
	Secondary Contact Recreation Fishing Wading Boating Trapping Other:
If In	terviewee (or family) used the stream for secondary contact Recreation, ask:
4.c.)	When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?
F.a.)	Where, exactly? Describe specific location and mark on the map.

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-V. Others to Contact

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Can you recommend someone else we could contact that know	rathe - co			
If yes, that person's contact info (name, address, pho	ne, directions?)	Yes	_ No	

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments

1.) From the Interviewee:

2.) From the Interviewer:

VII. Data Collectors Information

Has interviewer been trained by TCEQ or designee to conduct UAA Interviews? If yes, how (check all that apply)	el Yes	L No

Workshop? (if so, enter date): _____

On-line training seminar?

Followed Interview Instruction Sheets?_____

Other____

Interviewer Information:

Printed Name: Employer (where applicable):

Interviewer's phone #:_____E-mail:_____

Signature:

