



Missouri
Department of
Natural Resources

Use Attainability Analysis

for

WBID 0189 Elkhorn Creek

Submitted by
SES, Inc.

To
Missouri Department of Natural Resources
Water Protection Program

On
November 4, 2008

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet A – Water Body Identification

I. Water Body Information (for water body being surveyed)

Water Body Name (from USGS 7.5' quad): Elkhorn Creek
Missouri Water Body Identification (WBID) Number: 189
8-digit HUC: 07110008
County(ies), Listed Upstream to Downstream: Montgomery
Upstream Legal Description (from Table H): T48N R5W Sec. 3
Downstream Legal Description (from Table H): T50N R4W Sec. 22
Number of sites evaluated: 13
List all site numbers, <u>consecutively upstream to downstream</u> : 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Include a Site Location Map(s). The map must include all requirements detailed in the <i>Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol</i> (Section IV.D.8.a).

II. Facility Information (list all permitted discharges to this water body segment)

Facility Name(s) and Permit Number(s): Montgomery City WWTP East MO 0084158

III. UAA Surveyor (please **PRINT** legibly)

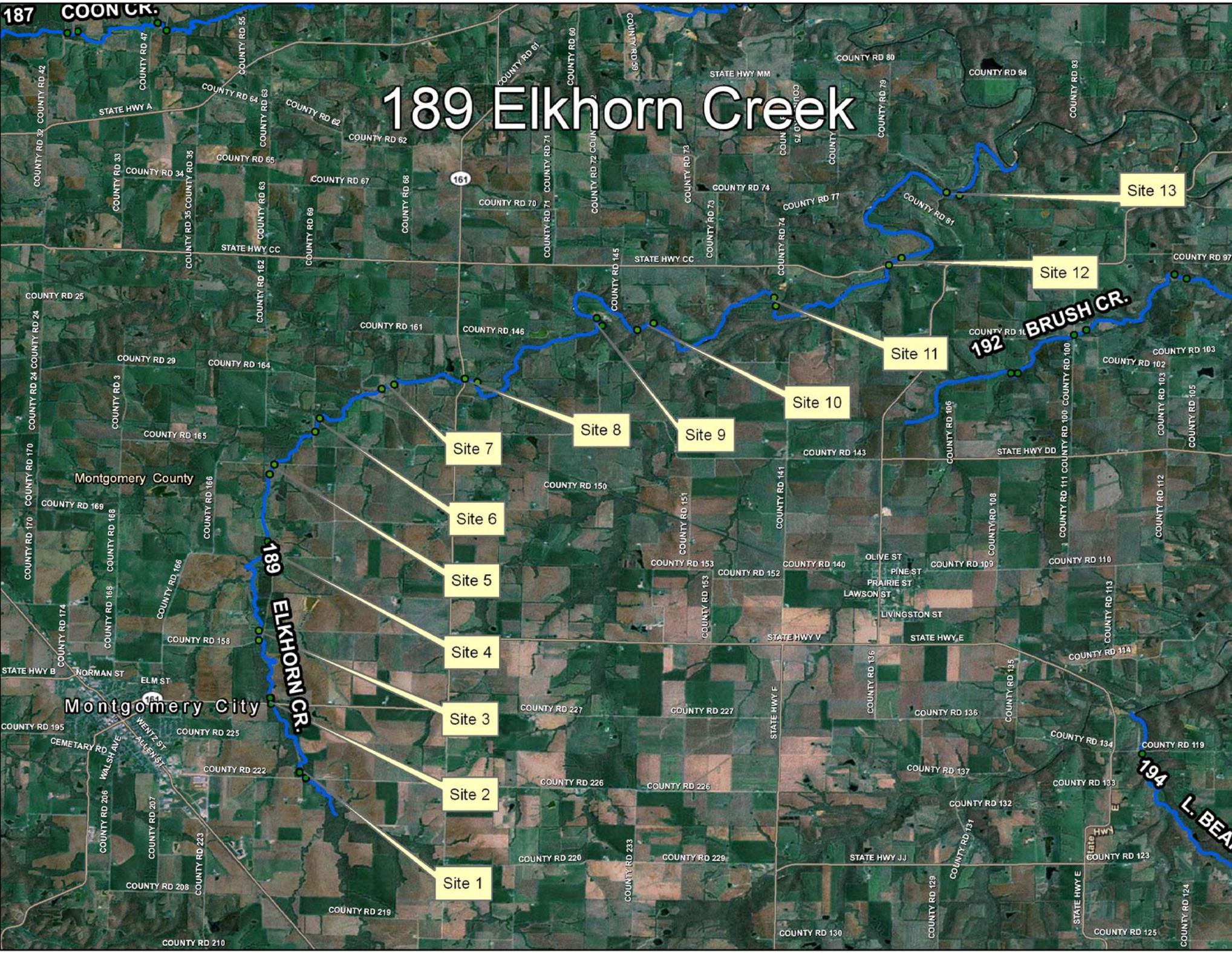
Name of Surveyor: David Bender	Telephone Number: 913-307-0046
Organization/Employer: SES, Inc.	

Please verify that you have completed all sections of all data sheets, checked all applicable boxes, provided a map (that includes all requirements listed in the *Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol*) and that this form is complete.

Signed: David Bender **Date:** 10-07-08

187 COON CR.

189 Elkhorn Creek



Site 13

Site 12

192 BRUSH CR.

Site 11

Site 10

Site 8

Site 9

Site 7

Site 6

Site 5

Site 4

Site 3

Site 2

Site 1

Montgomery County

Montgomery City

189 ELKHORN CR.

194 L. BEAR CR.

COUNTY RD 210

COUNTY RD 130

COUNTY RD 125

COUNTY RD 124

STATE HWY E

STATE HWY JJ

STATE HWY F

STATE HWY E

STATE HWY V

STATE HWY B

COUNTY RD 170

COUNTY RD 25

COUNTY RD 38

COUNTY RD 47

COUNTY RD 55

COUNTY RD 61

COUNTY RD 60

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COUNTY RD -210

COUNTY RD -211

COUNTY RD -212

WBID # 189

Site # 1

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

Date & Time: 10/07/08 7:45	Location Description (e.g., road crossing): C.R. 222
Stream Name: Elkhorn Cr.	
Current Weather Conditions: cloudy, few sprinkles	Facility Name(s): Montgomery City WWTP East
Weather Conditions for Past 10 days: 1.00 in	Permit Number(s): MO 0084158
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 06326669	Northing (UTM Y): 4314124	Horizontal Accuracy: (EPE / FOM / PDOP) 3 Meters
Site 11	Easting (UTM X): 0632550	Northing (UTM Y): 4314287	Horizontal Accuracy: (EPE / FOM / PDOP) 5 Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
121	Downstream	122	Upstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Site # 1

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

Evidence of Human Use*: (Attach photos and reference in “Photos” section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input checked="" type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	20% Gravel	70% Sand	% Silt	10% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

None

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input type="checkbox"/> Clear	<input type="checkbox"/> Green	<input checked="" type="checkbox"/> Gray	<input checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Site # 1

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: David Bender, Chris Schuler

Surveyor’s Signature: David Bender

Date of Survey: 10/07/08

Organization: SES, Inc.

Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Elkhorn Cr.</u> Waterbody ID: <u>189</u> Site #: <u>1</u> Estimated Channel Incision: <u>3</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0632669</u> UTM Y: <u>4314124</u> +/- <u>3</u> (meters) 11 UTM X: <u>0632550</u> UTM Y: <u>4314287</u> +/- <u>5</u> (meters) Average Stream Width: <u>7</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>David Bender, Chris Schuler</u>	Dissolved Oxygen Date: <u>10/7/2008</u> Time: <u>7:45</u> Dissolved Oxygen: <u>7.6</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>17.3</u> (°C)
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Transect Cross-Section

Station		01		02		03		04		05		06		07		08		09		10		11	
		Distance (m)	Depth (m)																				
Left Bank		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	0.70	0.30	0.70	0.10	0.50	0.10	0.70	0.40	0.70	0.05	0.40	0.05	0.70	0.15	0.80	0.10	0.80	0.30	0.90	0.05	1.00	0.10
	2	1.40	0.60	1.40	0.60	1.00	0.60	1.40	0.60	1.40	0.45	0.80	0.15	1.40	0.75	1.60	0.75	1.60	0.85	1.80	0.20	2.00	0.40
	3	2.10	0.80	2.10	0.75	1.50	0.75	2.10	0.80	2.10	0.60	1.20	0.20	2.10	1.00	2.40	0.95	2.40	0.85	2.70	0.25	3.00	0.70
	4	2.80	0.80	2.80	0.75	2.00	0.85	2.80	0.80	2.80	0.75	1.60	0.35	2.80	1.00	3.20	0.70	3.20	0.80	3.60	0.30	4.00	0.75
	5	3.50	0.80	3.50	0.80	2.50	0.85	3.50	0.85	3.50	0.85	2.00	0.55	3.50	1.00	4.00	0.70	4.00	0.85	4.50	0.30	5.00	0.80
	6	4.20	0.60	4.20	0.85	3.00	0.85	4.20	0.85	4.20	0.80	2.40	0.45	4.20	0.95	4.80	0.75	4.80	0.90	5.40	0.25	6.00	0.75
	7	4.90	0.75	4.90	0.80	3.50	0.75	4.90	0.75	4.90	0.75	2.80	0.30	4.90	0.75	5.60	0.70	5.60	0.90	6.30	0.20	7.00	0.85
	8	5.60	0.60	5.60	0.55	4.00	0.70	5.60	0.75	5.60	0.70	3.20	0.10	5.60	0.35	6.40	0.40	6.40	0.60	7.20	0.15	8.00	0.95
	9	6.30	0.25	6.30	0.20	4.50	0.25	6.30	0.65	6.30	0.25	3.60	0.10	6.30	0.05	7.20	0.15	7.20	0.20	8.10	0.10	9.00	0.55
Right Bank		7.00	0.00	7.00	0.00	5.00	0.00	7.00	0.00	7.00	0.00	4.00	0.00	7.00	0.00	8.00	0.00	8.00	0.00	9.00	0.00	10.00	0.00
Feature Type <small>(riffle, run, or pool)</small>		pool		pool		pool		pool		pool		pool		pool		pool		pool		pool		pool	

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

MAXIMUM 1.00

MEDIAN 0.70

Surveyor's Signature: David Bender Date: 10/7/2008

WBID # 189

Site # 2

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

Date & Time: 10/07/08 8:30	Location Description (e.g., road crossing): State Hwy 161
Stream Name: Elkhorn Cr.	
Current Weather Conditions: cloudy	Facility Name(s): Montgomery City WWTP East
Weather Conditions for Past 10 days: 1.00 in	Permit Number(s): MO 0084158
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0632043	Northing (UTM Y): 4315760	Horizontal Accuracy: (EPE / FOM / PDOP) 3 Meters
Site 11	Easting (UTM X): 0632037	Northing (UTM Y): 4315881	Horizontal Accuracy: (EPE / FOM / PDOP) 6 Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
123	Downstream	124	Upstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input checked="" type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

Evidence of Human Use*: (Attach photos and reference in “Photos” section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input checked="" type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	20% Gravel	70% Sand	% Silt	10% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Algae on 10% of substrate

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input type="checkbox"/> Clear	<input type="checkbox"/> Green	<input checked="" type="checkbox"/> Gray	<input checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

No flow

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

Printed Names of Personnel Collecting Data: David Bender, Chris Schuler

Surveyor's Signature: David Bender

Date of Survey: 10/07/08

Organization: SES, Inc.

Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Elkhorn Cr.</u> Waterbody ID: <u>189</u> Site #: <u>2</u> Estimated Channel Incision: <u>4</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0632043</u> UTM Y: <u>4315760</u> +/- <u>3</u> (meters) 11 UTM X: <u>0632037</u> UTM Y: <u>4315881</u> +/- <u>6</u> (meters) Average Stream Width: <u>7</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>David Bender, Chris Schuler</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>10/7/2008</u> Time: <u>8:30</u> Dissolved Oxygen: <u>7.8</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>17.2</u> (°C)
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Transect Cross-Section

Station		01		02		03		04		05		06		07		08		09		10		11	
		Distance (m)	Depth (m)																				
Left Bank		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		0.80	0.40	0.70	0.35	0.80	0.75	0.70	0.15	0.30	0.05	0.10	0.05	0.70	0.05	0.40	0.05	0.50	0.20	0.40	0.45	0.40	0.20
2		1.60	0.80	1.40	0.45	1.60	0.90	1.40	0.30	0.60	0.05	0.20	0.05	1.40	0.25	0.80	0.25	1.00	0.30	0.80	0.65	0.80	0.50
3		2.40	1.00	2.10	0.70	2.40	1.00	2.10	0.40	0.90	0.15	0.30	0.05	2.10	0.45	1.20	0.20	1.50	0.40	1.20	0.75	1.20	0.65
4		3.20	1.00	2.80	0.80	3.20	1.00	2.80	0.50	1.20	0.30	0.40	0.05	2.80	0.65	1.60	0.20	2.00	0.45	1.60	0.70	1.60	0.70
5		4.00	1.00	3.50	0.85	4.00	1.00	3.50	0.55	1.50	0.30	0.50	0.05	3.50	0.70	2.00	0.30	2.50	0.45	2.00	0.65	2.00	0.65
6		4.80	0.95	4.20	1.00	4.80	0.90	4.20	0.50	1.80	0.35	0.60	0.05	4.20	0.65	2.40	0.25	3.00	0.45	2.40	0.55	2.40	0.60
7		5.60	0.60	4.90	1.00	5.60	0.50	4.90	0.50	2.10	0.25	0.70	0.05	4.90	0.50	2.80	0.20	3.50	0.30	2.80	0.40	2.80	0.40
8		6.40	0.25	5.60	0.80	6.40	0.40	5.60	0.40	2.40	0.15	0.80	0.05	5.60	0.35	3.20	0.10	4.00	0.20	3.20	0.25	3.20	0.20
9		7.20	0.10	6.30	0.70	7.20	0.20	6.30	0.15	2.70	0.05	0.90	0.05	6.30	0.10	3.60	0.05	4.50	0.10	3.60	0.10	3.60	0.05
Right Bank		8.00	0.00	7.00	0.00	8.00	0.00	7.00	0.00	3.00	0.00	1.00	0.00	7.00	0.00	4.00	0.00	5.00	0.00	4.00	0.00	4.00	0.00
Feature Type (riffle, run, or pool)		pool		pool		pool		pool		pool		riffle		pool									

Mistakenly entered as 9.00. Was 0.9 or

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

MAXIMUM 1.00

MEDIAN 0.40

Surveyor's Signature: David Bender Date: 10/7/2008

WBID # 189

Site # 3

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

Date & Time: 10/07/08 9:10	Location Description (e.g., road crossing): C.R. 158
Stream Name: Elkhorn Cr.	
Current Weather Conditions: cloudy	Facility Name(s): Montgomery City WWTP East
Weather Conditions for Past 10 days: 1.00 in	Permit Number(s): MO 0084158
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0631807	Northing (UTM Y): 4317150	Horizontal Accuracy: (EPE / FOM / PDOP) 6 Meters
Site 11	Easting (UTM X): 0631805	Northing (UTM Y): 4317352	Horizontal Accuracy: (EPE / FOM / PDOP) 6 Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
125	Downstream	126	Upstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Site # 3

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

Evidence of Human Use*: (Attach photos and reference in "Photos" section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input checked="" type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	% Gravel	80% Sand	% Silt	20% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

None

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input type="checkbox"/> Clear	<input type="checkbox"/> Green	<input checked="" type="checkbox"/> Gray	<input checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input checked="" type="checkbox"/> Oil	<input checked="" type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: David Bender, Chris Schuler

Surveyor’s Signature: David Bender

Date of Survey: 10/07/08

Organization: SES, Inc.

Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Elkhorn Cr.</u> Waterbody ID: <u>189</u> Site #: <u>3</u> Estimated Channel Incision: <u>5</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0631807</u> UTM Y: <u>4317150</u> +/- <u>6</u> (meters) 11 UTM X: <u>0631805</u> UTM Y: <u>4317352</u> +/- <u>6</u> (meters) Average Stream Width: <u>6</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>David Bender, Chris Schuler</u>	Dissolved Oxygen Date: <u>10/7/2008</u> Time: <u>9:10</u> Dissolved Oxygen: <u>9.0</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>16.6</u> (°C)
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Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
	Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		0.20	0.05	0.50	0.40	0.50	0.20	0.60	0.35	0.60	0.10	0.50	0.10	0.50	0.20	0.50	1.00	0.40	0.05	0.60	0.10	0.60	0.30
2		0.40	0.10	1.00	0.55	1.00	0.75	1.20	1.00	1.20	0.70	1.00	0.50	1.00	0.85	1.00	1.00	0.80	0.30	1.20	0.20	1.20	0.75
3		0.60	0.05	1.50	0.50	1.50	0.95	1.80	1.00	1.80	0.85	1.50	0.50	1.50	1.00	1.50	1.00	1.20	0.55	1.80	0.60	1.80	0.65
4		0.80	0.05	2.00	0.60	2.00	1.00	2.40	1.00	2.40	0.80	2.00	0.45	2.00	1.00	2.00	1.00	1.60	0.65	2.40	1.00	2.40	0.70
5		1.00	0.05	2.50	0.60	2.50	0.10	3.00	0.75	3.00	0.85	2.50	0.30	2.50	1.00	2.50	1.00	2.00	0.65	3.00	1.00	3.00	1.00
6		1.20	0.01	3.00	0.60	3.00	0.90	3.60	0.65	3.60	0.90	3.00	0.30	3.00	1.00	3.00	1.00	2.40	0.60	3.60	1.00	3.60	1.00
7		1.40	0.10	3.50	0.60	3.50	0.75	4.20	0.55	4.20	0.75	3.50	0.15	3.50	1.00	3.50	0.90	2.80	0.60	4.20	1.00	4.20	0.85
8		1.60	0.05	4.00	0.45	4.00	0.60	4.80	0.45	4.80	0.45	4.00	0.10	4.00	0.75	4.00	0.60	3.20	0.55	4.80	1.00	4.80	0.45
9		1.80	0.01	4.50	0.20	4.50	0.30	5.40	0.15	5.40	0.30	4.50	0.05	4.50	0.60	4.50	0.15	3.60	0.25	5.40	1.00	5.40	0.15
	Right Bank	2.00	0.00	5.00	0.00	5.00	0.00	6.00	0.00	6.00	0.00	5.00	0.00	5.00	0.00	5.00	0.00	4.00	0.00	6.00	0.00	6.00	0.00
	Feature Type <small>(riffle, run, or pool)</small>	riffle		pool																			

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

MAXIMUM 1.00

MEDIAN 0.60

Surveyor's Signature: David Bender Date: 10/7/2008

WBID # 189

Site # 4

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

Date & Time: 10/07/08 9:55	Location Description (e.g., road crossing): C.R. 158
Stream Name: Elkhorn Cr.	
Current Weather Conditions: cloudy, rain	Facility Name(s): Montgomery City WWTP East
Weather Conditions for Past 10 days: 1.00 in	Permit Number(s): MO 0084158
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0631914	Northing (UTM Y): 4319064	Horizontal Accuracy: (EPE / FOM / PDOP) 7 Meters
Site 11	Easting (UTM X): 0631924	Northing (UTM Y): 4319314	Horizontal Accuracy: (EPE / FOM / PDOP) 8 Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
127	Downstream	128	Upstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

Evidence of Human Use*: (Attach photos and reference in “Photos” section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input checked="" type="checkbox"/> None of the above	Comments / Other:			

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

20% Cobble	60% Gravel	20% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Algae on 50% of substrate.

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input checked="" type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Site # 4

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: David Bender, Chris Schuler

Surveyor's Signature: David Bender

Date of Survey: 10/07/08

Organization: SES, Inc.

Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Elkhorn Cr.</u> Waterbody ID: <u>189</u> Site #: <u>4</u> Estimated Channel Incision: <u>4</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0631914</u> UTM Y: <u>4319064</u> +/- <u>7</u> (meters) 11 UTM X: <u>0631924</u> UTM Y: <u>4319314</u> +/- <u>8</u> (meters) Average Stream Width: <u>7</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>David Bender, Chris Schuler</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>10/7/2008</u> Time: <u>9:55</u> Dissolved Oxygen: <u>9.7</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>17.5</u> (°C)
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Transect Cross-Section

Station		01		02		03		04		05		06		07		08		09		10		11	
		Distance (m)	Depth (m)																				
Left Bank		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1	0.80	0.20	0.20	0.05	0.70	0.10	0.80	0.40	1.00	0.40	0.40	0.05	0.80	0.40	0.80	0.10	0.30	0.05	0.30	0.05	0.40	0.05
	2	1.60	0.35	0.40	0.05	1.40	0.15	1.60	0.70	2.00	1.00	0.80	0.05	1.60	0.45	1.60	0.50	0.60	0.10	0.60	0.50	0.80	0.05
	3	2.40	0.65	0.60	0.15	2.10	0.05	2.40	0.45	3.00	1.00	1.20	0.10	2.40	0.45	2.40	0.40	0.90	0.10	0.90	0.50	1.20	0.05
	4	3.20	0.95	0.80	0.15	2.80	0.20	3.20	0.50	4.00	1.00	1.60	0.05	3.20	0.35	3.20	0.40	1.20	0.10	1.20	0.50	1.60	0.05
	5	4.00	1.00	1.00	0.10	3.50	0.30	4.00	0.40	5.00	1.00	2.00	0.01	4.00	0.35	4.00	0.40	1.50	0.10	1.50	0.50	2.00	0.05
	6	4.80	1.00	1.20	0.10	4.20	0.25	4.80	0.40	6.00	1.00	2.40	0.05	4.80	0.20	4.80	0.30	1.80	0.10	1.80	0.50	2.40	0.05
	7	5.60	1.00	1.40	0.05	4.90	0.15	5.60	0.35	7.00	0.80	2.80	0.05	5.60	0.20	5.60	0.15	2.10	0.05	2.10	0.50	2.80	0.05
	8	6.40	0.60	1.60	0.10	5.60	0.10	6.40	0.25	8.00	0.65	3.20	0.05	6.40	0.10	6.40	0.15	2.40	0.10	2.40	0.50	3.20	0.05
	9	7.20	0.20	1.80	0.10	6.30	0.10	7.20	0.10	9.00	0.15	3.60	0.05	7.20	0.05	7.20	0.05	2.70	0.05	2.70	0.50	3.60	0.05
Right Bank		8.00	0.00	2.00	0.00	7.00	0.00	8.00	0.00	10.00	0.00	4.00	0.00	8.00	0.00	8.00	0.00	3.00	0.00	3.00	0.00	4.00	0.00
Feature Type <small>(riffle, run, or pool)</small>		pool		riffle		pool		pool		pool		riffle		pool		pool		riffle		riffle		riffle	

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

MAXIMUM 1.00

 MEDIAN 0.15

Surveyor's Signature: David Bender Date: 10/7/2008

WBID # 189

Site # 5

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

Date & Time: 10/07/08 10:30	Location Description (e.g., road crossing): C.R. 159
Stream Name: Elkhorn Cr.	
Current Weather Conditions: cloudy, rain	Facility Name(s): Montgomery City WWTP East
Weather Conditions for Past 10 days: 1.00 in	Permit Number(s): MO 0084158
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0631935	Northing (UTM Y): 4320792	Horizontal Accuracy: (EPE / FOM / PDOP) 7 Meters
Site 11	Easting (UTM X): 0632011	Northing (UTM Y): 4321006	Horizontal Accuracy: (EPE / FOM / PDOP) 3 Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
129	upstream	130	downstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep slopes	<input checked="" type="checkbox"/> Other:
Comments: none				

Evidence of Human Use*: (Attach photos and reference in “Photos” section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input checked="" type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	60% Gravel	40% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Algae on 30% of substrate

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Green	<input checked="" type="checkbox"/> Gray	<input checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input checked="" type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Site # 5

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: David Bender, Chris Schuler

Surveyor's Signature: David Bender

Date of Survey: 10/07/08

Organization: SES, Inc.

Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Elkhorn Cr.</u> Waterbody ID: <u>189</u> Site #: <u>5</u> Estimated Channel Incision: <u>4</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0631935</u> UTM Y: <u>4320792</u> +/- <u>7</u> (meters) 11 UTM X: <u>0632011</u> UTM Y: <u>4321006</u> +/- <u>3</u> (meters) Average Stream Width: <u>7</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>David Bender, Chris Schuler</u>	Dissolved Oxygen Date: <u>10/7/2008</u> Time: <u>10:30</u> Dissolved Oxygen: <u>9.2</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>17.5</u> (°C)
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Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)																				
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.70	0.55	0.80	0.05	0.10	0.01	0.20	0.15	0.70	0.35	0.80	0.30	0.40	0.05	0.80	0.40	0.20	0.05	0.60	0.01	0.20	0.05
2	1.40	1.00	1.60	0.35	0.20	0.05	0.40	0.25	1.40	0.40	1.60	0.70	0.80	0.15	1.60	0.55	0.40	0.70	1.20	0.10	0.40	0.05
3	2.10	1.00	2.40	0.55	0.30	0.05	0.60	0.25	2.10	0.65	2.40	0.75	1.20	0.15	2.40	0.55	0.60	0.55	1.80	0.20	0.60	0.05
4	2.80	1.00	3.20	0.55	0.40	0.10	0.80	0.20	2.80	0.60	3.20	0.95	1.60	0.30	3.20	0.50	0.80	0.45	2.40	0.25	0.80	0.15
5	3.50	1.00	4.00	0.45	0.50	0.10	1.00	0.15	3.50	0.85	4.00	1.00	2.00	0.45	4.00	0.45	1.00	0.35	3.00	0.20	1.00	0.15
6	4.20	0.95	4.80	1.00	0.60	0.05	1.20	0.05	4.20	0.95	4.80	1.00	2.40	0.50	4.80	0.45	1.20	0.25	3.60	0.20	1.20	0.15
7	4.90	0.50	5.60	1.00	0.70	0.05	1.40	0.05	4.90	0.95	5.60	0.80	2.80	0.50	5.60	0.30	1.40	0.15	4.20	0.25	1.40	0.20
8	5.60	0.20	6.40	0.85	0.80	0.05	1.60	0.05	5.60	0.60	6.40	0.70	3.20	0.50	6.40	0.15	1.60	0.10	4.80	0.35	1.60	0.25
9	6.30	0.05	7.20	0.40	0.90	0.01	1.80	0.01	6.30	0.10	7.20	0.40	3.60	0.50	7.20	0.10	1.80	0.05	5.40	0.25	1.80	0.15
Right Bank	7.00	0.00	8.00	0.00	1.00	0.00	2.00	0.00	7.00	0.00	8.00	0.00	4.00	0.00	8.00	0.00	2.00	0.00	6.00	0.00	2.00	0.00
Feature Type <small>(riffle, run, or pool)</small>	pool	pool	pool	pool	riffle	riffle	riffle	riffle	run	run	run	run	pool	pool	pool	pool	pool	pool	pool	pool	pool	riffle

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

MAXIMUM 1.00

 MEDIAN 0.30

Surveyor's Signature: David Bender Date: 10/7/2008

WBID # 189

Site # 6

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

Date & Time: 10/07/08 11:00	Location Description (e.g., road crossing): C.R. 160
Stream Name: Elkhorn Cr.	
Current Weather Conditions: cloudy, rain	Facility Name(s): Montgomery City WWTP East
Weather Conditions for Past 10 days: 1.00 in	Permit Number(s): MO 0084158
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0632698	Northing (UTM Y): 4321735	Horizontal Accuracy: (EPE / FOM / PDOP) 6 Meters
Site 11	Easting (UTM X): 0632770	Northing (UTM Y): 4322039	Horizontal Accuracy: (EPE / FOM / PDOP) 3 Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
131	Downstream	132	Upstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

Evidence of Human Use*: (Attach photos and reference in “Photos” section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input checked="" type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	80% Gravel	20% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Algae on 60% of substrate

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: David Bender, Chris Schuler

Surveyor's Signature: David Bender

Date of Survey: 10/07/08

Organization: SES, Inc.

Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Elkhorn Cr.</u> Waterbody ID: <u>189</u> Site #: <u>6</u> Estimated Channel Incision: <u>5</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0632698</u> UTM Y: <u>4321735</u> +/- <u>6</u> (meters) 11 UTM X: <u>0632770</u> UTM Y: <u>4322039</u> +/- <u>3</u> (meters) Average Stream Width: <u>10</u> (meters) Length of Survey Segment: <u>200</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>David Bender, Chris Schuler</u>	Dissolved Oxygen Date: <u>10/7/2008</u> Time: <u>11:00</u> Dissolved Oxygen: <u>7.0</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>17.9</u> (°C)
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Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)																				
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.70	0.15	1.10	0.35	0.90	0.05	0.50	0.05	0.90	0.20	0.30	0.05	0.30	0.05	0.20	0.05	0.40	0.05	0.70	0.05	0.60	0.05
2	1.40	0.30	2.20	0.35	1.80	0.15	1.00	0.25	1.80	0.55	0.60	0.10	0.60	0.05	0.40	0.05	0.80	0.05	1.40	0.10	1.20	0.10
3	2.10	0.50	3.30	0.50	2.70	0.30	1.50	0.40	2.70	0.65	0.90	0.20	0.90	0.05	0.60	0.10	1.20	0.05	2.10	0.15	1.80	0.15
4	2.80	0.55	4.40	0.50	3.60	0.45	2.00	0.60	3.60	0.75	1.20	0.25	1.20	0.05	0.80	0.10	1.60	0.50	2.80	0.20	2.40	0.15
5	3.50	0.50	5.50	0.60	4.50	0.50	2.50	0.50	4.50	0.85	1.50	0.20	1.50	0.05	1.00	0.15	2.00	0.10	3.50	0.25	3.00	0.20
6	4.20	0.55	6.60	0.70	5.40	0.45	3.00	0.45	5.40	0.95	1.80	0.15	1.80	0.10	1.20	0.05	2.40	0.10	4.20	0.25	3.60	0.15
7	4.90	0.50	7.70	0.65	6.30	0.45	3.50	0.55	6.30	1.00	2.10	0.15	2.10	0.05	1.40	0.05	2.80	0.15	4.90	0.25	4.20	0.10
8	5.60	0.45	8.80	0.50	7.20	0.25	4.00	0.60	7.20	0.60	2.40	0.15	2.40	0.05	1.60	0.05	3.20	0.10	5.60	0.15	4.80	0.10
9	6.30	0.25	9.90	0.25	8.10	0.10	4.50	0.15	8.10	0.25	2.70	0.05	2.70	0.05	1.80	0.05	3.60	0.05	6.30	0.05	5.40	0.05
Right Bank	7.00	0.00	11.00	0.00	9.00	0.00	5.00	0.00	9.00	0.00	3.00	0.00	3.00	0.00	2.00	0.00	4.00	0.00	7.00	0.00	6.00	0.00
Feature Type <small>(riffle, run, or pool)</small>	pool		riffle		riffle		riffle		run		pool		pool									

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

MAXIMUM 1.00

MEDIAN 0.15

Surveyor's Signature: David Bender Date: 10/7/2008

WBID # 189

Site # 7

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

Date & Time: 10/07/08 15:40	Location Description (e.g., road crossing): C.R. 163
Stream Name: Elkhorn Cr.	
Current Weather Conditions: cloudy	Facility Name(s): Montgomery City WWTP East
Weather Conditions for Past 10 days: 1.00 in	Permit Number(s): MO 0084158
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0633821	Northing (UTM Y): 4322705	Horizontal Accuracy: (EPE / FOM / PDOP) 9 Meters
Site 11	Easting (UTM X): 0634038	Northing (UTM Y): 4322801	Horizontal Accuracy: (EPE / FOM / PDOP) 6 Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
141	Beaver dam	142	Downstream	143	upstream
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

Evidence of Human Use*: (Attach photos and reference in "Photos" section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input checked="" type="checkbox"/> None of the above	Comments / Other:			

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

20% Cobble	70% Gravel	10% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Algae on 100% of substrate

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Green	<input checked="" type="checkbox"/> Gray	<input checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Site # 7

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

Beaver dam upstream of transect 1

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

Printed Names of Personnel Collecting Data: David Bender, Chris Schuler

Surveyor's Signature: David Bender

Date of Survey: 10/07/08

Organization: SES, Inc.

Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Elkhorn Cr.</u> Waterbody ID: <u>189</u> Site #: <u>7</u> Estimated Channel Incision: <u>7</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0633821</u> UTM Y: <u>4322705</u> +/- <u>9</u> (meters) 11 UTM X: <u>0634038</u> UTM Y: <u>4322801</u> +/- <u>6</u> (meters) Average Stream Width: <u>7</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>David Bender, Chris Schuler</u>	Dissolved Oxygen Date: <u>10/7/2008</u> Time: <u>15:40</u> Dissolved Oxygen: <u>9.6</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>18.7</u> (°C)
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Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)																				
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	3.60	0.05	0.30	0.15	0.20	0.05	0.50	0.15	0.50	0.10	0.60	0.30	0.60	0.25	0.40	0.05	0.50	0.05	0.50	0.05	0.80	0.05
2	7.20	0.05	0.60	0.20	0.40	0.10	1.00	0.40	1.00	0.35	1.20	0.55	1.20	1.00	0.80	0.05	1.00	0.25	1.00	0.10	1.60	0.50
3	10.80	0.05	0.90	0.25	0.60	0.20	1.50	0.30	1.50	0.25	1.80	0.60	1.80	1.00	1.20	0.05	1.50	0.40	1.50	0.35	2.40	0.75
4	14.40	0.10	1.20	0.30	0.80	0.25	2.00	0.30	2.00	0.25	2.40	0.50	2.40	0.90	1.60	0.05	2.00	0.35	2.00	0.55	3.20	0.85
5	18.00	0.10	1.50	0.30	1.00	0.15	2.50	0.20	2.50	0.15	3.00	0.45	3.00	0.65	2.00	0.10	2.50	0.30	2.50	0.70	4.00	0.90
6	21.60	0.15	1.80	0.20	1.20	0.10	3.00	0.10	3.00	0.10	3.60	0.40	3.60	0.50	2.40	0.10	3.00	0.35	3.00	0.70	4.80	0.95
7	25.20	0.05	2.10	0.10	1.40	0.10	3.50	0.15	3.50	0.10	4.20	0.40	4.20	0.35	2.80	0.10	3.50	0.35	3.50	0.60	5.60	0.75
8	28.80	0.05	2.40	0.10	1.60	0.05	4.00	0.05	4.00	0.10	4.80	0.30	4.80	0.25	3.20	0.05	4.00	0.30	4.00	0.40	6.40	0.65
9	32.40	0.05	2.70	0.05	1.80	0.05	4.50	0.01	4.50	0.10	5.40	0.20	5.40	0.05	3.60	0.05	4.50	0.10	4.50	0.20	7.20	0.20
Right Bank	36.00	0.00	3.00	0.00	2.00	0.00	5.00	0.00	5.00	0.00	6.00	0.00	6.00	0.00	4.00	0.00	5.00	0.00	5.00	0.00	8.00	0.00
Feature Type <small>(riffle, run, or pool)</small>	riffle	pool		riffle	pool		pool		pool		pool		riffle		pool		pool		pool		pool	

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

MAXIMUM 1.00

 MEDIAN 0.20

Surveyor's Signature: David Bender Date: 10/7/2008

WBID # 189

Site # 8

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

Date & Time: 10/07/08 11:45	Location Description (e.g., road crossing): State HWY 161
Stream Name: Elkhorn Cr.	
Current Weather Conditions: cloudy	Facility Name(s): Montgomery City WWTP East
Weather Conditions for Past 10 days: 1.00 in	Permit Number(s): MO 0084158
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0635246	Northing (UTM Y): 4322948	Horizontal Accuracy: (EPE / FOM / PDOP) 4 Meters
Site 11	Easting (UTM X): 0635460	Northing (UTM Y): 4322876	Horizontal Accuracy: (EPE / FOM / PDOP) 6 Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
133	Downstream	134	Upstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input checked="" type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

Evidence of Human Use*: (Attach photos and reference in “Photos” section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input checked="" type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	60% Gravel	40% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Algae on 20% of substrate

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input type="checkbox"/> Clear	<input type="checkbox"/> Green	<input checked="" type="checkbox"/> Gray	<input checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input checked="" type="checkbox"/> Oil	<input checked="" type="checkbox"/> Scum	<input checked="" type="checkbox"/> Foam	<input type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Site # 8

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: David Bender, Chris Schuler

Surveyor's Signature: David Bender

Date of Survey: 10/07/08

Organization: SES, Inc.

Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Elkhorn Cr.</u> Waterbody ID: <u>189</u> Site #: <u>8</u> Estimated Channel Incision: <u>4</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0635246</u> UTM Y: <u>4322948</u> +/- <u>4</u> (meters) 11 UTM X: <u>0635460</u> UTM Y: <u>4322876</u> +/- <u>6</u> (meters) Average Stream Width: <u>7</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>David Bender, Chris Schuler</u>	Dissolved Oxygen Date: <u>10/7/2008</u> Time: <u>11:45</u> Dissolved Oxygen: <u>9.7</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>18.1</u> (°C)
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Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)																				
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.60	0.05	0.50	0.15	0.70	0.15	0.90	0.15	0.70	0.40	0.80	0.35	0.90	0.75	0.70	0.50	1.60	0.10	1.50	0.65	1.50	0.10
2	1.20	0.20	1.00	0.45	1.40	0.35	1.80	0.60	1.40	0.75	1.60	1.00	1.80	1.00	1.40	0.85	3.20	0.50	3.00	0.90	3.00	0.65
3	1.80	0.25	1.50	0.40	2.10	0.35	2.70	0.75	2.10	1.00	2.40	1.00	2.70	1.00	2.10	1.00	4.80	0.75	4.50	1.00	4.50	0.90
4	2.40	0.25	2.00	0.45	2.80	0.45	3.60	0.70	2.80	0.95	3.20	1.00	3.60	1.00	2.80	1.00	6.40	1.00	6.00	1.00	6.00	1.00
5	3.00	0.30	2.50	0.40	3.50	0.50	4.50	0.75	3.50	0.85	4.00	0.90	4.50	0.85	3.50	1.00	8.00	1.00	7.50	1.00	7.50	1.00
6	3.60	0.30	3.00	0.35	4.20	0.40	5.40	0.60	4.20	0.70	4.80	0.70	5.40	0.60	4.20	1.00	9.60	0.95	9.00	1.00	9.00	1.00
7	4.20	0.20	3.50	0.30	4.90	0.35	6.30	0.15	4.90	0.50	5.60	0.55	6.30	0.35	4.90	0.80	11.20	0.75	10.50	1.00	10.50	0.90
8	4.80	0.10	4.00	0.20	5.60	0.25	7.20	0.30	5.60	0.30	6.40	0.25	7.20	0.25	5.60	0.50	12.80	0.55	12.00	1.00	12.00	0.65
9	5.40	0.05	4.50	0.15	6.30	0.15	8.10	0.20	6.30	0.10	7.20	0.15	8.10	0.15	6.30	0.35	14.40	0.40	13.50	0.75	13.50	0.30
Right Bank	6.00	0.00	5.00	0.00	7.00	0.00	9.00	0.00	7.00	0.00	8.00	0.00	9.00	0.00	7.00	0.00	16.00	0.00	15.00	0.00	15.00	0.00
Feature Type <small>(riffle, run, or pool)</small>	pool																					

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

MAXIMUM 1.00

 MEDIAN 0.55

Surveyor's Signature: David Bender Date: 10/7/2008

WBID # 189

Site # 9

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

Date & Time: 10/07/08 12:40	Location Description (e.g., road crossing): C.R. 145
Stream Name: Elkhorn Cr.	
Current Weather Conditions: cloudy	Facility Name(s): Montgomery City WWTP East
Weather Conditions for Past 10 days: 1.00 in	Permit Number(s): MO 0084158
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)				
Site 01	Easting (UTM X): 0637585	Northing (UTM Y): 4324155	Horizontal Accuracy: (EPE / FOM / PDOP)	5 Meters
Site 11	Easting (UTM X): 0637488	Northing (UTM Y): 4324318	Horizontal Accuracy: (EPE / FOM / PDOP)	7 Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
135	Downstream	136	Upstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input checked="" type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

Evidence of Human Use*: (Attach photos and reference in “Photos” section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input checked="" type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	100% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Algae on 100% of substrate; smartweed family along water’s edge

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: David Bender, Chris Schuler

Surveyor's Signature: David Bender

Date of Survey: 10/07/08

Organization: SES, Inc.

Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Elkhorn Cr.</u> Waterbody ID: <u>189</u> Site #: <u>9</u> Estimated Channel Incision: <u>4</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0637585</u> UTM Y: <u>4324155</u> +/- <u>5</u> (meters) 11 UTM X: <u>0637488</u> UTM Y: <u>4324318</u> +/- <u>7</u> (meters) Average Stream Width: <u>7</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>David Bender, Chris Schuler</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>10/7/2008</u> Time: <u>12:40</u> Dissolved Oxygen: <u>14.2</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>19.6</u> (°C)
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Transect Cross-Section

Station		01		02		03		04		05		06		07		08		09		10		11	
		Distance (m)	Depth (m)																				
Left Bank		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1	0.60	0.05	0.80	0.10	0.50	0.05	0.50	0.05	0.70	0.05	0.50	0.05	0.50	0.05	0.60	0.05	0.70	0.10	0.80	0.05	0.90	0.30
	2	1.20	0.15	1.60	0.75	1.00	0.15	1.00	0.20	1.40	0.25	1.00	0.20	1.00	0.15	1.20	0.20	1.40	0.15	1.60	0.40	1.80	0.35
	3	1.80	0.15	2.40	0.85	1.50	0.35	1.50	0.30	2.10	0.30	1.50	0.45	1.50	0.15	1.80	0.30	2.10	0.25	2.40	0.40	2.70	0.55
	4	2.40	0.20	3.20	0.85	2.00	0.45	2.00	0.40	2.80	0.45	2.00	0.60	2.00	0.15	2.40	0.25	2.80	0.35	3.20	0.50	3.60	0.50
	5	3.00	0.30	4.00	0.70	2.50	0.60	2.50	0.40	3.50	0.55	2.50	0.60	2.50	0.20	3.00	0.15	3.50	0.30	4.00	0.45	4.50	0.45
	6	3.60	0.35	4.80	0.80	3.00	0.75	3.00	0.40	4.20	0.55	3.00	0.55	3.00	0.25	3.60	0.20	4.20	0.35	4.80	0.45	5.40	0.40
	7	4.20	0.30	5.60	0.75	3.50	0.75	3.50	0.40	4.90	0.40	3.50	0.35	3.50	0.20	4.20	0.10	4.90	0.50	5.60	0.35	6.30	0.45
	8	4.80	0.20	6.40	0.45	4.00	0.35	4.00	0.45	5.60	0.30	4.00	0.30	4.00	0.20	4.80	0.20	5.60	0.45	6.40	0.15	7.20	0.20
	9	5.40	0.15	7.20	0.30	4.50	0.05	4.50	0.35	6.30	0.20	4.50	0.20	4.50	0.20	5.40	0.25	6.30	0.20	7.20	0.10	8.10	0.05
Right Bank		6.00	0.00	8.00	0.00	5.00	0.00	5.00	0.00	7.00	0.00	5.00	0.00	5.00	0.00	6.00	0.00	7.00	0.00	8.00	0.00	9.00	0.00
Feature Type <small>(riffle, run, or pool)</small>		riffle		pool																			

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

MAXIMUM 0.85

 MEDIAN 0.30

Surveyor's Signature: David Bender Date: 10/7/2008

WBID # 189

Site # 10

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

Date & Time: 10/07/08 17:45	Location Description (e.g., road crossing): C.R. 145
Stream Name: Elkhorn Cr.	
Current Weather Conditions: partly cloudy	Facility Name(s): Montgomery City WWTP East
Weather Conditions for Past 10 days: 1.00 in	Permit Number(s): MO 0084158
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0638190	Northing (UTM Y): 4324067	Horizontal Accuracy: (EPE / FOM / PDOP) 6 Meters
Site 11	Easting (UTM X): 0638468	Northing (UTM Y): 43324218	Horizontal Accuracy: (EPE / FOM / PDOP) 7 Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
146	Downstream	147	Upstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input checked="" type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

Evidence of Human Use*: (Attach photos and reference in “Photos” section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input checked="" type="checkbox"/> None of the above	Comments / Other:			

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

10% Cobble	70% Gravel	20% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Algae on 10% of substrate.

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input checked="" type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Site # 10

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

Moved site upstream due to permission

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

Printed Names of Personnel Collecting Data: David Bender, Chris Schuler

Surveyor's Signature: David Bender

Date of Survey: 10/07/08

Organization: SES, Inc.

Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Elkhorn Cr.</u> Waterbody ID: <u>189</u> Site #: <u>10</u> Estimated Channel Incision: <u>4</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0638190</u> UTM Y: <u>4324067</u> +/- <u>6</u> (meters) 11 UTM X: <u>0638468</u> UTM Y: <u>4324218</u> +/- <u>7</u> (meters) Average Stream Width: <u>10</u> (meters) Length of Survey Segment: <u>200</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>David Bender, Chris Schuler</u>	Dissolved Oxygen Date: <u>10/7/2008</u> Time: <u>17:45</u> Dissolved Oxygen: <u>10.6</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>18.5</u> (°C)
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Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)																				
Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0.70	0.10	1.00	0.30	1.10	0.50	1.20	0.45	0.90	0.50	0.60	0.05	0.60	0.05	0.60	0.05	0.40	0.35	0.80	0.10	0.70	0.05
2	1.40	0.25	2.00	0.75	2.20	1.00	2.40	1.00	1.80	0.65	1.20	0.15	1.20	0.25	1.20	0.20	0.80	0.40	1.60	0.30	1.40	0.10
3	2.10	0.50	3.00	0.70	3.30	0.90	3.60	1.00	2.70	0.50	1.80	0.20	1.80	0.35	1.80	0.25	1.20	0.65	2.40	0.50	2.10	0.30
4	2.80	0.75	4.00	0.60	4.40	0.85	4.80	0.90	3.60	0.65	2.40	0.25	2.40	0.35	2.40	0.25	1.60	0.75	3.20	0.85	2.80	0.15
5	3.50	0.75	5.00	0.65	5.50	0.80	6.00	0.85	4.50	0.55	3.00	0.25	3.00	0.30	3.00	0.30	2.00	0.80	4.00	1.00	3.50	0.20
6	4.20	0.60	6.00	0.75	6.60	0.75	7.20	0.80	5.40	0.45	3.60	0.35	3.60	0.25	3.60	0.30	2.40	0.75	4.80	1.00	4.20	0.60
7	4.90	0.65	7.00	0.70	7.70	0.65	8.40	0.80	6.30	0.30	4.20	0.55	4.20	0.15	4.20	0.25	2.80	0.45	5.60	0.90	4.90	0.45
8	5.60	0.25	8.00	0.60	8.80	0.55	9.60	0.45	7.20	0.20	4.80	0.50	4.80	0.10	4.80	0.20	3.20	0.30	6.40	0.50	5.60	0.25
9	6.30	0.05	9.00	0.25	9.90	0.30	10.80	0.20	8.10	0.10	5.40	0.30	5.40	0.05	5.40	0.10	3.60	0.10	7.20	0.05	6.30	0.10
Right Bank	7.00	0.00	10.00	0.00	11.00	0.00	12.00	0.00	9.00	0.00	6.00	0.00	6.00	0.00	6.00	0.00	4.00	0.00	8.00	0.00	7.00	0.00
Feature Type <small>(riffle, run, or pool)</small>	pool		run		run		run		pool		pool		pool									

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

MAXIMUM 1.00

MEDIAN 0.40

Surveyor's Signature: David Bender Date: 10/7/2008

WBID # 189

Site # 11

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

Date & Time: 10/07/08 14:15	Location Description (e.g., road crossing): C.R.74
Stream Name: Elkhorn Cr.	
Current Weather Conditions: cloudy	Facility Name(s): Montgomery City WWTP East
Weather Conditions for Past 10 days: 1.00 in	Permit Number(s): MO 0084158
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0640530	Northing (UTM Y): 4324820	Horizontal Accuracy: (EPE / FOM / PDOP) 2 Meters
Site 11	Easting (UTM X): 0640561	Northing (UTM Y): 4324641	Horizontal Accuracy: (EPE / FOM / PDOP) 2 Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
137	Downstream	138	Upstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

Evidence of Human Use*: (Attach photos and reference in “Photos” section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input checked="" type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	70% Gravel	30% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Algae on 30% of substrate

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: David Bender, Chris Schuler

Surveyor's Signature: David Bender

Date of Survey: 10/07/08

Organization: SES, Inc.

Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Elkhorn Cr.</u> Waterbody ID: <u>189</u> Site #: <u>11</u> Estimated Channel Incision: <u>3</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0640530</u> UTM Y: <u>4324820</u> +/- <u>2</u> (meters) 11 UTM X: <u>0640561</u> UTM Y: <u>4324641</u> +/- <u>2</u> (meters) Average Stream Width: <u>5</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>David Bender, Chris Schuler</u>	Dissolved Oxygen Date: <u>10/7/2008</u> Time: <u>14:15</u> Dissolved Oxygen: <u>10.3</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>18.1</u> (°C)
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Transect Cross-Section

		01		02		03		04		05		06		07		08		09		10		11	
Station		Distance (m)	Depth (m)																				
	Left Bank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1		0.15	0.05	0.60	0.05	0.40	0.05	0.50	0.15	0.20	0.01	0.30	0.05	0.80	0.10	0.80	0.05	0.50	0.05	0.70	0.05	0.80	0.35
2		0.30	0.05	1.20	0.25	0.80	0.20	1.00	0.20	0.40	0.15	0.60	0.15	1.60	0.30	1.60	0.05	1.00	0.15	1.40	0.55	1.60	0.65
3		0.45	0.10	1.80	0.30	1.20	0.15	1.50	0.15	0.60	0.15	0.90	0.15	2.40	0.30	2.40	0.15	1.50	0.25	2.10	0.80	2.40	1.00
4		0.60	0.10	2.40	0.35	1.60	0.05	2.00	0.15	0.80	0.15	1.20	0.15	3.20	0.45	3.20	0.25	2.00	0.45	2.80	1.00	3.20	1.00
5		0.75	0.10	3.00	0.30	2.00	0.05	2.50	0.15	1.00	0.15	1.50	0.15	4.00	0.50	4.00	0.25	2.50	0.55	3.50	1.00	4.00	1.00
6		0.90	0.05	3.60	0.30	2.40	0.05	3.00	0.15	1.20	0.05	1.80	0.10	4.80	0.40	4.80	0.15	3.00	0.60	4.20	0.90	4.80	1.00
7		1.05	0.10	4.20	0.25	2.80	0.05	3.50	0.10	1.40	0.05	2.10	0.10	5.60	0.30	5.60	0.15	3.50	0.65	4.90	0.90	5.60	1.00
8		1.20	0.05	4.80	0.15	3.20	0.05	4.00	0.05	1.60	0.05	2.40	0.05	6.40	0.15	6.40	0.25	4.00	0.45	5.60	0.90	6.40	0.40
9		1.35	0.05	5.40	0.05	3.60	0.05	4.50	0.01	1.80	0.01	2.70	0.05	7.20	0.05	7.20	0.10	4.50	0.20	6.30	0.65	7.20	0.10
	Right Bank	1.50	0.00	6.00	0.00	4.00	0.00	5.00	0.00	2.00	0.00	3.00	0.00	8.00	0.00	8.00	0.00	5.00	0.00	7.00	0.00	8.00	0.00
	Feature Type	riffle		pool		riffle		riffle		riffle		riffle		pool									

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width
 GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.
 Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)
 Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)
 All measurements to be taken to the nearest 0.01 meter.

MAXIMUM 1.00

 MEDIAN 0.15

Surveyor's Signature: David Bender Date: 10/7/2008

WBID # 189

Site # 12

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

Date & Time: 10/07/08 14:45	Location Description (e.g., road crossing): State Hwy CC
Stream Name: Elkhorn Cr.	
Current Weather Conditions: cloudy	Facility Name(s): Montgomery City WWTP East
Weather Conditions for Past 10 days: 1.00 in	Permit Number(s): MO 0084158
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0642487	Northing (UTM Y): 4325575	Horizontal Accuracy: (EPE / FOM / PDOP) 6 Meters
Site 11	Easting (UTM X): 0642694	Northing (UTM Y): 4325733	Horizontal Accuracy: (EPE / FOM / PDOP) Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
139	Downstream	140	Upstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input checked="" type="checkbox"/> Fence	<input checked="" type="checkbox"/> No trespass sign	<input type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

Evidence of Human Use*: (Attach photos and reference in "Photos" section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input checked="" type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	90% Gravel	10% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Algae on 30% of substrate

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: David Bender, Chris Schuler

Surveyor's Signature: David Bender

Date of Survey: 10/07/08

Organization: SES, Inc.

Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Elkhorn Cr.</u> Waterbody ID: <u>189</u> Site #: <u>12</u> Estimated Channel Incision: <u>5</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0642487</u> UTM Y: <u>4325575</u> +/- <u>6</u> (meters) 11 UTM X: <u>0642694</u> UTM Y: <u>4325733</u> +/- <u> </u> (meters) Average Stream Width: <u>7</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>David Bender, Chris Schuler</u>	Dissolved Oxygen Date: <u>10/7/2008</u> Time: <u>14:45</u> Dissolved Oxygen: <u>9.7</u> (mg/L) Dissolved Oxygen: <u> </u> (% sat) Specific Cond: <u> </u> (µS/cm) Water Temperature: <u>18.8</u> (°C)
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Transect Cross-Section

Station		01		02		03		04		05		06		07		08		09		10		11	
		Distance (m)	Depth (m)																				
Left Bank		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1	0.40	0.05	0.40	0.40	0.50	0.05	0.50	0.05	0.70	0.15	0.80	0.25	0.70	0.15	0.80	0.10	1.00	0.20	1.00	0.30	1.10	0.30
	2	0.80	0.05	0.80	0.20	1.00	0.05	1.00	0.10	1.40	0.35	1.60	0.60	1.40	0.45	1.60	0.45	2.00	0.35	2.00	0.40	2.20	0.50
	3	1.20	0.05	1.20	0.10	1.50	0.05	1.50	0.10	2.10	0.55	2.40	0.75	2.10	0.60	2.40	0.25	3.00	0.35	3.00	0.35	3.30	0.55
	4	1.60	0.05	1.60	0.15	2.00	0.20	2.00	0.05	2.80	0.60	3.20	0.65	2.80	0.50	3.20	0.25	4.00	0.35	4.00	0.30	4.40	0.55
	5	2.00	0.05	2.00	0.10	2.50	0.20	2.50	0.05	3.50	0.65	4.00	0.60	3.50	0.35	4.00	0.25	5.00	0.35	5.00	0.45	5.50	0.50
	6	2.40	0.05	2.40	0.10	3.00	0.25	3.00	0.05	4.20	0.70	4.80	0.50	4.20	0.30	4.80	0.20	6.00	0.40	6.00	0.40	6.60	0.50
	7	2.80	0.05	2.80	0.05	3.50	0.35	3.50	0.05	4.90	0.65	5.60	0.35	4.90	0.30	5.60	0.25	7.00	0.40	7.00	0.35	7.70	0.50
	8	3.20	0.05	3.20	0.05	4.00	0.25	4.00	0.05	5.60	0.60	6.40	0.20	5.60	0.25	6.40	0.15	8.00	0.15	8.00	0.70	8.80	0.70
	9	3.60	0.05	3.60	0.05	4.50	0.05	4.50	0.05	6.30	0.10	7.20	0.10	6.30	0.10	7.20	0.05	9.00	0.10	9.00	0.45	9.90	0.15
Right Bank		4.00	0.00	4.00	0.00	5.00	0.00	5.00	0.00	7.00	0.00	8.00	0.00	7.00	0.00	8.00	0.00	10.00	0.00	10.00	0.00	11.00	0.00
Feature Type <small>(riffle, run, or pool)</small>		riffle		run		pool		riffle		pool													

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

MAXIMUM 0.75

MEDIAN 0.25

Surveyor's Signature: David Bender Date: 10/7/2008

WBID # 189

Site # 13

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 1 of 3)

(must be completed for each site)

Date & Time: 10/07/08 16:40	Location Description (e.g., road crossing): C.R. 79
Stream Name: Elkhorn Cr.	
Current Weather Conditions: clear	Facility Name(s): Montgomery City WWTP East
Weather Conditions for Past 10 days: 1.00 in	Permit Number(s): MO 0084158
Official Drought Conditions at time of this survey (search DNR home page for “drought”): No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0643444	Northing (UTM Y): 4327182	Horizontal Accuracy: (EPE / FOM / PDOP) 8 Meters
Site 11	Easting (UTM X): 0643666	Northing (UTM Y): 4327126	Horizontal Accuracy: (EPE / FOM / PDOP) 5 Meters

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
144	Downstream	145	Upstream		
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose

Uses Observed*: (Uses actually observed at the time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:
Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use <i>Data Sheet D- Recreational Use Interview</i> when conducting interviews.)				

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 2 of 3)

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input checked="" type="checkbox"/> Rural Residential
<input type="checkbox"/> Campgrounds	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> Fence	<input checked="" type="checkbox"/> No trespass sign	<input checked="" type="checkbox"/> Steep slopes	<input type="checkbox"/> Other:
Comments:				

Evidence of Human Use*: (Attach photos and reference in "Photos" section.)

<input type="checkbox"/> Roads	<input type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Rope swings
<input type="checkbox"/> RV / ATV Tracks	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Livestock Watering
<input checked="" type="checkbox"/> None of the above	Comments / Other:			

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

% Cobble	100% Gravel	% Sand	% Silt	% Mud/Clay	% Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

None

Water Characteristics*: (Mark all that apply.)

Odor:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
Color:	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input type="checkbox"/> Other:
Bottom Deposit:	<input type="checkbox"/> Sludge	<input checked="" type="checkbox"/> Solids	<input type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
Surface Deposit:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B – Site Characterization (Page 3 of 3)

Additional Stream Morphology: (Record isolated pools or other features identified during the survey that may support recreational uses.)

Channel Feature	Distance from access location (m)	Width (m)	Length (m)	Median Depth (m)	Max Depth (m)

Comments: (Please record any additional comments here.)

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

Printed Names of Personnel Collecting Data: David Bender, Chris Schuler

Surveyor’s Signature: David Bender

Date of Survey: 10/07/08

Organization: SES, Inc.

Position: Field Team Leader

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: <u>Elkhorn Cr.</u> Waterbody ID: <u>189</u> Site #: <u>13</u> Estimated Channel Incision: <u>4</u> (m) (height between low bank width and water) GPS Location - Easting (UTM X), Northing (UTM Y), Horizontal Accuracy Estimate (EPE / PDOP / FOM) 01 UTM X: <u>0643444</u> UTM Y: <u>4327182</u> +/- <u>8</u> (meters) 11 UTM X: <u>0643666</u> UTM Y: <u>4327126</u> +/- <u>5</u> (meters) Average Stream Width: <u>7</u> (meters) Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) (20x average stream width) Field Staff: <u>David Bender, Chris Schuler</u>	<h4 style="text-align: center; margin: 0;">Dissolved Oxygen</h4> Date: <u>10/7/2008</u> Time: <u>16:40</u> Dissolved Oxygen: <u>8.6</u> (mg/L) Dissolved Oxygen: _____ (% sat) Specific Cond: _____ (µS/cm) Water Temperature: <u>17.9</u> (°C)
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Transect Cross-Section

Station		01		02		03		04		05		06		07		08		09		10		11	
		Distance (m)	Depth (m)																				
Left Bank		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	0.80	0.10	1.00	0.05	0.70	0.05	0.50	0.05	0.70	0.05	0.60	0.05	0.70	0.05	0.80	0.10	0.80	0.05	0.40	0.05	0.60	0.05
	2	1.60	0.15	2.00	0.30	1.40	0.10	1.00	0.20	1.40	0.25	1.20	0.15	1.40	0.45	1.60	0.55	1.60	0.20	0.80	0.15	1.20	0.15
	3	2.40	0.15	3.00	0.80	2.10	0.30	1.50	0.30	2.10	0.45	1.80	0.25	2.10	0.65	2.40	0.75	2.40	0.35	1.20	0.15	1.80	0.40
	4	3.20	0.20	4.00	0.90	2.80	0.50	2.00	0.25	2.80	0.35	2.40	0.25	2.80	0.85	3.20	0.75	3.20	0.35	1.60	0.05	2.40	0.55
	5	4.00	0.15	5.00	0.85	3.50	0.65	2.50	0.20	3.50	0.35	3.00	0.45	3.50	1.00	4.00	0.60	4.00	0.40	2.00	0.10	3.00	0.60
	6	4.80	0.40	6.00	0.60	4.20	0.65	3.00	0.20	4.20	0.29	3.60	0.55	4.20	1.00	4.80	0.35	4.80	0.30	2.40	0.10	3.60	0.55
	7	5.60	0.65	7.00	0.50	4.90	0.45	3.50	0.15	4.90	0.20	4.20	0.65	4.90	1.00	5.60	0.15	5.60	0.25	2.80	0.15	4.20	0.45
	8	6.40	0.75	8.00	0.25	5.60	0.35	4.00	0.05	5.60	0.30	4.80	0.65	5.60	1.00	6.40	0.15	6.40	0.25	3.20	0.15	4.80	0.30
	9	7.20	0.40	9.00	0.05	6.30	0.35	4.50	0.05	6.30	0.25	5.40	0.45	6.30	1.00	7.20	0.05	7.20	0.10	3.60	0.05	5.40	0.15
Right Bank		8.00	0.00	10.00	0.00	7.00	0.00	5.00	0.00	7.00	0.00	6.00	0.00	7.00	0.00	8.00	0.00	8.00	0.00	4.00	0.00	6.00	0.00
Feature Type <small>(riffle, run, or pool)</small>		pool		pool		pool		riffle		pool		riffle		pool									

Notes: Transects will be measured beginning on left descending bank (0 depth) and finishing on right descending bank (0 depth). This width is the wetted width

GPS locations corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine by dividing wetted width by ten)

Mark dry depth measurements as 0; record actual measurements to 0.1 meter unless depth is too deep to measure (then record as > 1)

All measurements to be taken to the nearest 0.01 meter.

MAXIMUM 1.00

MEDIAN 0.30

Surveyor's Signature: David Bender

Date: 10/7/2008

WBID# 0189 Elkhorn Creek



Site# 1 Photo ID# 121, Downstream



Site# 1 Photo ID# 122, Upstream



Site# 2 Photo ID# 123, Downstream



Site# 2 Photo ID# 124 Upstream

WBID# 0189 Elkhorn Creek



Site# 3 Photo ID# 125, Downstream



Site# 3 Photo ID# 126, Upstream



Site# 4 Photo ID# 127, Downstream



Site# 4 Photo ID# 128 Upstream

WBID# 0189 Elkhorn Creek



Site# 5 Photo ID# 129, Upstream



Site# 5 Photo ID# 130, Downstream



Site# 6 Photo ID# 131, Downstream



Site# 6 Photo ID# 132, Upstream

WBID# 0189 Elkhorn Creek



Site# 7 Photo ID# 141, "Beaver Dam"



Site# 7 Photo ID# 142, Downstream



Site# 7 Photo ID# 143, Upstream



Site# 8 Photo ID# 133, Downstream

WBID# 0189 Elkhorn Creek



Site# 8 Photo ID# 134, Upstream



Site# 9 Photo ID# 135, Downstream



Site# 9 Photo ID# 136, Upstream



Site# 10 Photo ID# 146, Downstream

WBID# 0189 Elkhorn Creek



Site# 10 Photo ID# 147, Upstream



Site# 11 Photo ID# 137, Downstream



Site# 11 Photo ID# 138, Upstream



Site# 12 Photo ID# 139, Downstream

WBID# 0189 Elkhorn Creek



Site# 12 Photo ID# 140, Upstream



Site# 13 Photo ID# 144, Downstream



Site# 13 Photo ID# 145, Upstream