



Use Attainability Analysis

for

WBID 3559 Cox Branch

Submitted by  
MEC Water Resources

To  
Missouri Department of Natural Resources  
Water Protection Program

Date Received: December 1, 2007

**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):	Cox Branch
Missouri Water Body Identification (WBID) Number:	3559
8-digit HUC:	County: Phelps
Upstream Legal Description (from Table H):	Highway V
Downstream Legal Description (from Table H):	Mouth
Number of sites evaluated	3
List all sites numbers, listed consecutively upstream to downstream:	

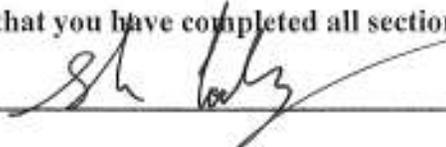
**II. Discharger Facility Information** (list all permitted dischargers on the stream)

Discharger Facility Name(s):	Cedar Knoll Retirement Facility
Discharger Permit Number(s):	MO0120588

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

Name of Surveyor	James Deverka, Tim Attner	Telephone Number:	573-443-4100
Organization/Employer:	MEC Water Resources		
Position:	Water Quality Scientist		

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

Signed:  Date: 10/31/07

WBID # 3559 <sup>3559</sup>  
 Site # 1

**Field Data Sheets for Recreational Use Stream Surveys**

**Data Sheet B – Site Characterization**  
 (must be completed for each site)

Date & Time: <u>10/23/07 10:50</u>	Site Location Description (e.g., road crossing): <u>North of Route V</u>
Personnel (Data Collectors): <u>SU/TA</u>	Facility Name:
Current Weather Conditions: <u>P.A. Cloudy / 53°F</u>	Permit Number:
Weather Conditions for Past 10 days: <u>Sunny Showers / Clear</u>	
Drought Conditions?: No drought <input 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): <u>4209317</u>	Northing (UTM Y): <u>0615282</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>5.1</u> Meters
Site 11	Easting (UTM X): <u>4209417</u>	Northing (UTM Y): <u>0615844</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>5.7</u> Meters

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
<u>3559-L-1258</u>	<u>Up Stream</u>	<u>3559-L-1259</u>	<u>Down Stream</u>		

**Uses Observed\*:** (Uses actually observed at 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 Data Sheet D- Recreational Use Interview when conducting interviews.)

WBID # 3559Site # 1**Field Data Sheets for Recreational Use Stream Surveys****Data Sheet B – Site Characterization (continued)****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 checked="" type="checkbox"/> Other: <u>Pasture</u>
Comments: <u>and forest land</u>				

**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
Comments / Other: <u>None observed</u>				

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

<u>10</u> % Cobble	<u>10</u> % Gravel	<u>70</u> % Sand	<del><u>5</u></del> % Silt	<u>5</u> % Mud/Clay	<u>5</u> % Bedrock
<u>30</u>					

**Aquatic Vegetation\*:** (Note amount of vegetation or algal growth at the assessment site)Smartweed, grasses, willow, algal growth uncommon**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 type="checkbox"/> Solids	<input type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Other: <u>Leaf mnts</u>
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 effect another use.

WBID # 3559

Site # 1

**Field Data Sheets for Recreational Use Stream Surveys**

**Data Sheet B – Site Characterization (continued)**

**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.)

None

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

Surveyor's Signature:  Date of Survey: 10/23/07

Organization: MEC Water Resources Position: Water Quality Scientist

RWC 10-30-07

# Field Data Sheets for Recreational Use Stream Surveys

## Data Sheet C - Field Survey Results

Waterbody ID: <u>3559</u> Site #: <u>1</u> (whid, site #) Estimated Channel Incision: <u>0.25</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>4209317</u> UTM Y: <u>1550615782</u> +/- <u>5.1</u> (meters) 11 UTM X: <u>4209417</u> UTM Y: <u>1550615844</u> +/- <u>5.7</u> (meters) Average Stream Width: <u>7</u> (meters)      Length of Survey Segment: <u>150</u> (meters) (To determine Length of Reach) Field Staff: <u>SU/PA</u>	Date: <u>10/23/07</u> Time: <u>10:50</u> Dissolved Oxygen: <u>2.40</u> (mg/L) Dissolved Oxygen: <u>21.9</u> (% sat) Specific Cond: <u>420.9</u> (µS/cm) Water Temperature: <u>11.1</u> (°C)
---	---

		Transect Cross-Section																						
		01		02		03		04		05		06		07		08		09		10		11		
Station	Feature Type (riff, rap, or pool)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	
1	Left Bank	0.11	0.03	0.48	0.03	Dry	0.37	0.01	0.53	0.20	0.20	0.05	0.19	0.12	0.23	0.26	0.16	0.07	0.49	0.15				
2		0.23	0.06	0.96	0.08		0.74	0.04	1.06	0.34	0.40	0.15	0.38	0.14	0.46	0.29	0.33	0.09	0.98	0.26				
3		0.33	0.07	1.44	0.07		1.11	0.08	1.59	0.40	0.60	0.19	0.57	0.15	0.69	0.31	0.48	0.16	1.47	0.33				
4		0.44	0.08	1.92	0.19		1.48	0.06	2.12	0.84	0.80	0.19	0.76	0.14	0.92	0.22	0.64	0.18	1.96	0.33				
5		0.55	0.10	2.40	0.20		1.85	0.06	2.65	0.41	1.00	0.17	0.95	0.15	1.15	0.25	0.80	0.18	2.45	0.37				
6		0.66	0.09	2.88	0.21		2.22	0.08	3.18	0.44	1.20	0.18	1.14	0.14	1.38	0.25	0.96	0.22	2.94	0.25				
7		0.77	0.04	3.26	0.14		2.58	0.01	3.71	0.40	1.40	0.15	1.33	0.15	1.61	0.22	1.12	0.19	3.43	0.16				
8		0.88	0.00	3.84	0.10		2.96	0.05	4.24	0.24	1.60	0.15	1.52	0.15	1.84	0.14	1.28	0.14	3.92	0.20				
9		0.99	0.00	4.32	0.04		3.33	0.03	4.77	0.14	1.80	0.07	1.71	0.08	2.07	0.06	1.44	0.08	4.41	0.15				
	Right Bank	1.10	0	4.80	0		3.70	0	5.30	0	2.00	0	1.90	0	2.30	0	1.60	0	4.90	0				
	Feature Type (riff, rap, or pool)	Run	Run	Run	Dry	Run	Run	Run																

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 correspond to Transect 01 and 11. Transects ordered in upstream to downstream order.  
 Depth measurements taken at 10 equally spaced locations along transect (distance by dividing wetted width by ten).  
 Mark dry depth measurements as 0; record actual measurements to 0.01 meter unless depth is too deep to measure (then record as > 1).  
 All measurements to be taken to the nearest 0.01 meter.

Signed: [Signature]      Date: 10/23/07

Dec 10-30-07

WBID # 3559  
 Site # 2

**Field Data Sheets for Recreational Use Stream Surveys**

**Data Sheet B – Site Characterization**  
 (must be completed for each site)

Date & Time: <u>10/23/07</u> <u>9:50</u>	Site Location Description (e.g., road crossing): <u>West of CRD 2450</u>
Personnel (Data Collectors): <u>JV/TA</u>	Facility Name:
Current Weather Conditions: <u>Pt. Cloudy / 53°F</u>	Permit Number:
Weather Conditions for Past 10 days: <u>Spotty Showers/clear</u>	
Drought Conditions?: 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): <u>4209656</u>	Northing (UTM Y): <u>0617661</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>9.3</u> Meters
Site 11	Easting (UTM X): <u>4209763</u>	Northing (UTM Y): <u>0617723</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>5.9</u> Meters

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
<u>3559.2.155a</u>	<u>Up stream</u>	<u>3559.2.157</u>	<u>Down Stream</u>		

**Uses Observed\*:** (Uses actually observed at 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 Data Sheet D- Recreational Use Interview when conducting interviews.)

WBID # 3559Site # 2**Field Data Sheets for Recreational Use Stream Surveys****Data Sheet B – Site Characterization (continued)****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 checked="" type="checkbox"/> Other: <u>Pasture</u>
Comments: <u>Forest land</u>				

**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
Comments / Other: <u>None observed</u>				

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

<u>10</u> % Cobble	<u>15</u> % Gravel	<u>65</u> % Sand	% Silt	% Mud/Clay	<u>10</u> % Bedrock
--------------------	--------------------	------------------	--------	------------	---------------------

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

<u>Willow, grasses, smartweed, algal growth uncommon</u>
--

**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 type="checkbox"/> Solids	<input type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Other: <u>Leaf matter</u>
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 effect another use.

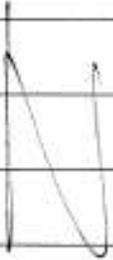
WBID # 3559

Site # 2

**Field Data Sheets for Recreational Use Stream Surveys**

**Data Sheet B – Site Characterization (continued)**

**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.)

None

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

Surveyor's Signature:  Date of Survey: 10/23/07  
Organization: MEC Water Resources Position: Water Quality Scientist  
RUC 10-30-07



WBID # 3559  
 Site # 3-1-3

**Field Data Sheets for Recreational Use Stream Surveys**

**Data Sheet B – Site Characterization**

(must be completed for each site)

Date & Time: <u>10/23/07 9:16</u>	Site Location Description (e.g., road crossing): <u>off CRD 2450</u>
Personnel (Data Collectors): <u>SU/TA</u>	
Current Weather Conditions: <u>H. Cl. 50°F</u>	Facility Name:
Weather Conditions for Past 10 days: <u>Spotty Rain/Clow</u>	Permit Number:
Drought Conditions?: 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): <u>4209915</u>	Northing (UTM Y): <u>0618239</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>14.5</u> Meters
Site 11	Easting (UTM X): <u>4209919</u>	Northing (UTM Y): <u>0618386</u>	Horizontal Accuracy: (EPE / FOM / PDOP) <u>28.6</u> Meters

**Photos:**

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
<u>3559-3-1254</u>	<u>Upstream</u>	<u>3559-3-1255</u>	<u>Downstream</u>		

**Uses Observed\*:** (Uses actually observed at 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 Data Sheet D- Recreational Use Interview when conducting interviews.)

WBID # 5557Site # 5**Field Data Sheets for Recreational Use Stream Surveys****Data Sheet B – Site Characterization (continued)****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 checked="" type="checkbox"/> Other: <u>Pasture</u>
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
Comments / Other: <u>No observed</u>				

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

<u>10</u> % Cobble	<u>10</u> % Gravel	<u>75</u> % Sand	% Silt	% Mud/Clay	<u>5</u> % Bedrock
--------------------	--------------------	------------------	--------	------------	--------------------

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

<u>Smartweed, Salix (Willow), algal growth uncommon</u>
---

**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 type="checkbox"/> Solids	<input type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Other: <u>leaf muck</u>
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 effect another use.

WBID # 3559

Site # 3

**Field Data Sheets for Recreational Use Stream Surveys**

**Data Sheet B – Site Characterization (continued)**

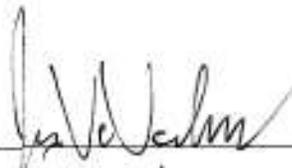
**Additional Stream Morphology:** (Record isolated pools or other features identified during the survey that may support recreational uses)

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

**Comments:** (Please record any additional comments here.)

None

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

Surveyor's Signature:  Date of Survey: 10/25/07

Organization: MEC Water Resources Position: Water Quality Scientist

*RUC 10-30-07*



# Cox Branch (WBID 3559)



- Upstream Boundary
- Downstream Boundary



**WBID# 3559 Cox Branch**



**Site# 2 Photo ID# 59, Upstream, T11**

**WBID# 3559 Cox Branch**

