Missouri
Department of
Natural Resources

Use Attainability Analysis

for

WBID 0604 Elk Creek

Submitted by
MEC Water Resources

To
Missouri Department of Natural Resources
Water Protection Program

On
October 17, 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): Elk Cr.
Missouri Water Body Identification (WBID) Number: 0604
8-digit HUC: 10280103
County(ies), Listed Upstream to Downstream: Linn, Chariton
Upstream Legal Description (from Table H): 25, 57N, 20W
Downstream Legal Description (from Table H): Silver Lake
Number of sites evaluated: 7
List all site numbers, consecutively upstream to downstream: Site 1: Iguana Rd. Site 4: Bushnell Rd. Site 7: 50m dnstream of site 6 Site 2: Canadian Rd Site 5: Fulbright Rd. Site 3: Stutsman Rd Site 6: Rt E Crossing
Include a Site Location Map(s). The map must include all requirements detailed in the *Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol* (Section IV.D.8.a).

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

Facility Name(s) and Permit Number(s): Brookfield Swimming Pool - MO 0046922 Brookfield Southwest WWTF - MO 0028738

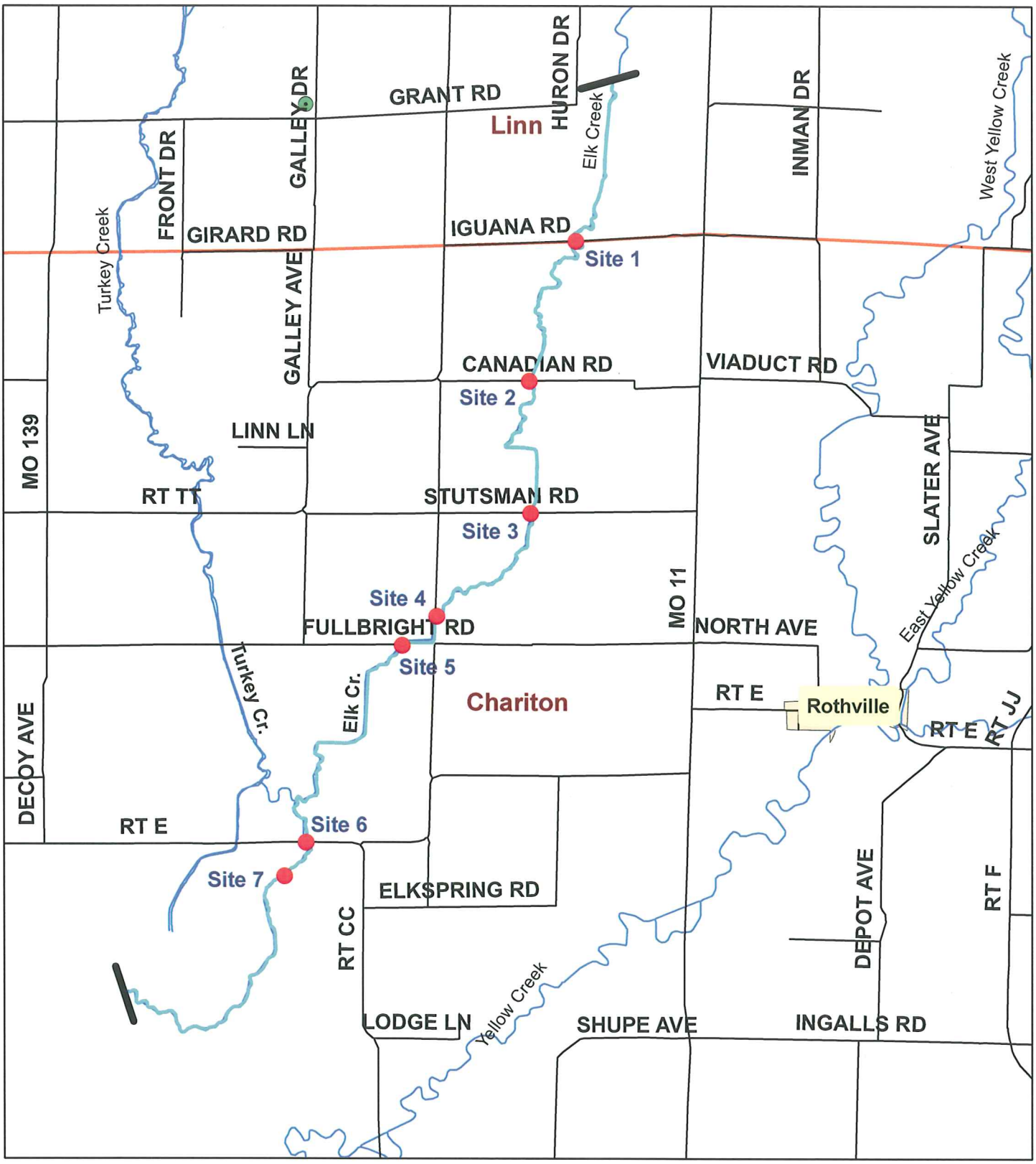
III. UAA Surveyor (please **PRINT** legibly)

Name of Surveyor: Renee Martin	Telephone Number: 573-443-4100
Organization/Employer: MEC Water Resources / AE Solutions	

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

Signed: Renee Martin **Date:** 10/13/08

RWC 10-16-08



Elk Creek
WBID 0604
Linn County

Meters
0 750 1,500 3,000 4,500

N
W E
S

WBID # ~~0607~~ 604

Site # 01

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: 10/06/08 9:30	Location Description (e.g., road crossing): Off of Iquana Rd
Stream Name: Elk Cr	
Current Weather Conditions: Pt. Cldy, Calm, 65°F	Facility Name(s): Brookfield Swimming Pool & Brookfield SW, WWTF
Weather Conditions for Past 10 days: Clear, Rain 0.61" rain	Permit Number(s): MO 0046922, MO 0028738
Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought ☒; Phase I ☐; Phase II ☐; Phase III ☐; Phase IV ☐; Unknown ☐	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 155 0491357	Northing (UTM Y): 4395103	Horizontal Accuracy: (EPE / FOM / PDOP) 82 ~~Meters~~ SV ft
Site 11	Easting (UTM X): 0491266	Northing (UTM Y): 4395022	Horizontal Accuracy: (EPE / FOM / PDOP) 26 ~~Meters~~ ft

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
604-1-109	Upstream	604-1-110	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.)

☐ Swimming	☐ Skin diving	☐ SCUBA diving	☐ Tubing	☐ Water skiing
☐ Wind surfing	☐ Kayaking	☐ Boating	☐ Wading	☐ Rafting
☐ Hunting	☐ Trapping	☐ Fishing	☒ None of the above	☐ 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.)

N/A

Stream Name & WBID # Elk Cr ~~0607~~ SV 6094 Date of Survey 10/01/08

Site # 01

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.)

☐ City/county parks	☐ Playgrounds	☐ MDC conservation lands	☐ Urban areas	☒ Rural Residential
☐ Campgrounds	☐ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ Boating accesses	☐ Fence	☐ No trespass sign	☒ Steep slopes	☐ Other: Pasture & Row Crop
Comments: private property				

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

☐ Roads	☐ Foot paths/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
☐ RV / ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock Watering
☒ None of the above	Comments / Other: N/A			

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

— % Cobble	— % Gravel	30 % Sand	30 % Silt	40 % Mud/Clay	— % Bedrock

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

Hydrilla, Wild rice, grasses, algal growth common

Water Characteristics*: (Mark all that apply.)

Odor:	☐ Sewage	☐ Musky	☐ Chemical	☒ None	☐ Other:
Color:	☐ Clear	☐ Green	☐ Gray	☐ Milky	☒ Other: brown
Bottom Deposit:	☐ Sludge	☐ Solids	☒ Fine sediments	☐ None	☐ Other:
Surface Deposit:	☐ Oil	☐ Scum	☐ Foam	☒ None	☐ 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.

Stream Name & WBID # Elk Cr 0604 Date of Survey 10/06/08

Site # 01

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)
		N/A			

Comments: (Please record any additional comments here.)

N/A

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

Printed Names of Personnel Collecting Data: James Valerka, Jennifer Hrabik

Surveyor's Signature: James ValerkaDate of Survey: 10/06/08

Organization: MEC Water Position: Water Quality Scientist

RWC 10-16-08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: Elk Creek Waterbody ID: 0604 Site #: 0604_01

Estimated Channel Incision: 0.10 (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:	491357	UTM Y:	4395103	+/- 82	(feet)
11	UTM X:	491266	UTM Y:	4395022	+/- 26	(feet)

Average Stream Width: 5.0 (meters) (To determne Length of Reach)

Length of Survey Segment: 150 (meters) (20x average stream width)

Field Staff: JH,JV

Dissolved Oxygen

Date: 10.06.08 Time: 9:30

Dissolved Oxygen: 3.66 (mg/L)

Dissolved Oxygen: 38.3 (% sat)

Specific Cond: 491.1 (µS/cm)

Water Temperature: 16.5 (°C)

Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	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)
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	0.56	0.20	0.44	0.08	0.28	0.10	0.47	0.05	0.48	0.13	0.59	0.18	0.51	0.05	0.53	0.32	0.46	0.27	0.67	0.36	0.68	0.14
2	1.12	0.21	0.88	0.10	0.56	0.12	0.94	0.12	0.96	0.19	1.18	0.31	1.02	0.10	1.06	0.45	0.92	0.38	1.34	0.56	1.36	0.23
3	1.68	0.23	1.32	0.18	0.84	0.24	1.41	0.20	1.44	0.22	1.77	0.43	1.53	0.13	1.59	0.54	1.38	0.44	2.01	0.72	2.04	0.26
4	2.24	0.27	1.76	0.21	1.12	0.25	1.88	0.24	1.92	0.25	2.36	0.44	2.04	0.16	2.12	0.49	1.84	0.55	2.68	0.74	2.72	0.35
5	2.80	0.20	2.20	0.24	1.40	0.29	2.35	0.22	2.40	0.25	2.95	0.39	2.55	0.17	2.65	0.33	2.30	0.55	3.35	0.71	3.40	0.36
6	3.36	0.28	2.64	0.22	1.68	0.25	2.82	0.28	2.88	0.27	3.54	0.34	3.06	0.14	3.18	0.26	2.76	0.59	4.02	0.60	4.08	0.44
7	3.92	0.30	3.08	0.25	1.96	0.25	3.29	0.31	3.36	0.21	4.13	0.32	3.57	0.21	3.71	0.25	3.22	0.50	4.69	0.49	4.76	0.48
8	4.48	0.29	3.52	0.11	2.24	0.13	3.76	0.32	3.84	0.19	4.72	0.29	4.08	0.24	4.24	0.30	3.68	0.45	5.36	0.35	5.44	0.26
9	5.04	0.18	3.96	0.07	2.52	0.04	4.23	0.25	4.32	0.12	5.31	0.12	4.59	0.25	4.77	0.26	4.14	0.19	6.03	0.25	6.12	0.14
Right Bank	5.60	0.00	4.40	0.00	2.80	0.00	4.70	0.00	4.80	0.00	5.90	0.00	5.10	0.00	5.30	0.00	4.60	0.00	6.70	0.00	6.80	0.05
Feature Type (riffle, run, or pool)	Run		Run		Run		Run		Run		Run		Run		Run		Pool		Pool		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 corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine bv 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.

Surveyor's Signature: _____ Date: 10.06.08

WBID # ~~0607~~ 0604 JV

Site # 02

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: 10/06/08 10:15	Location Description (e.g., road crossing): Off of Canadian Rd
Stream Name: Elk Cr	
Current Weather Conditions: Pt. Cldy, Calm, 65°F	Facility Name(s): Brookfield Swimming Pool, Brookfield SW, WWTF
Weather Conditions for Past 10 days: 0.61" rain Clear, Light Rain, ~~[illegible]~~ JV	Permit Number(s): MO0046922, MO0028738
Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought ☒; Phase I ☐; Phase II ☐; Phase III ☐; Phase IV ☐; Unknown ☐	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site 01	Easting (UTM X): 0490748	Northing (UTM Y): 4395355	Horizontal Accuracy: (EPE / FOM / PDOP) 46 ~~Meters~~ JV ft
Site 11	Easting (UTM X): 0490676	Northing (UTM Y): 4393204	Horizontal Accuracy: (EPE / FOM / PDOP) 21 ~~Meters~~ JV ft

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
604_2_111	Upstream	604_2_112	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.)

☐ Swimming	☐ Skin diving	☐ SCUBA diving	☐ Tubing	☐ Water skiing
☐ Wind surfing	☐ Kayaking	☐ Boating	☐ Wading	☐ Rafting
☐ Hunting	☐ Trapping	☐ Fishing	☒ None of the above	☐ 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.)

N/A

JRH

Stream Name & WBID # Elk Cr ~~0607~~ 0604 Date of Survey 10/06/08

Site # 02

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.)

☐ City/county parks	☐ Playgrounds	☐ MDC conservation lands	☐ Urban areas	☒ Rural Residential
☐ Campgrounds	☐ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ Boating accesses	☐ Fence	☐ No trespass sign	☒ Steep slopes	☒ Other: Pasture & Row Crop

Comments: private property

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

☐ Roads	☐ Foot paths/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
☐ RV / ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock Watering
☒ None of the above	Comments / Other: N/A			

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

— % Cobble	— % Gravel	— % Sand	20 % Silt	80 % Mud/Clay	— % Bedrock

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

Hydrilla, grasses, willow algal growth common

Water Characteristics*: (Mark all that apply.)

Odor:	☐ Sewage	☐ Musky	☐ Chemical	☒ None	☐ Other:
Color:	☒ Clear	☐ Green	☐ Gray	☐ Milky	☐ Other:
Bottom Deposit:	☐ Sludge	☐ Solids	☒ Fine sediments	☐ None	☐ Other:
Surface Deposit:	☐ Oil	☐ Scum	☐ Foam	☒ None	☐ 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.

DEH

Stream Name & WBID # Elk Cr ~~0607~~ 0604 JCH

Site # 02

Date of Survey 10/06/8

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)
		N/A			

Comments: (Please record any additional comments here.)

N/A

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

Printed Names of Personnel Collecting Data: James VeVerka, Sonny Hrabik

Surveyor's Signature: Jas VeVerka Date of Survey: 10/06/08

Organization: MEC Weston Position: Water Quality Scientist

QWC 10-16-08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: Elk Creek Waterbody ID: 0604 Site #: 0604_02

Estimated Channel Incision: 0.00 (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:	490748	UTM Y:	4393355	+/- 46	(feet)
11	UTM X:	490676	UTM Y:	4393204	+/- 21	(feet)

Average Stream Width: 5.0 (meters) (To determne Length of Reach)

Length of Survey Segment: 150 (meters) (20x average stream width)

Field Staff: JH, JV

Dissolved Oxygen

Date: 10.06.08 Time: 10:15

Dissolved Oxygen: 5.84 (mg/L)

Dissolved Oxygen: 59.5 (% sat)

Specific Cond: 381.6 (µS/cm)

Water Temperature: 16.1 (°C)

Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	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)
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	0.42	0.01	0.60	0.24	0.34	0.25	0.36	0.08	0.31	0.28	0.18	0.20	0.44	0.21	0.51	0.25	0.57	0.34	0.48	0.30	0.36	0.25
2	0.84	0.00	1.20	0.11	0.68	0.13	0.72	0.10	0.62	0.32	0.36	0.24	0.88	0.31	1.02	0.28	1.14	0.41	0.96	0.35	0.72	0.40
3	1.26	0.04	1.80	0.16	1.02	0.00	1.08	0.14	0.93	0.40	0.54	0.20	1.32	0.31	1.53	0.33	1.71	0.49	1.44	0.40	1.08	0.41
4	1.68	0.10	2.40	0.19	1.36	0.00	1.44	0.09	1.24	0.40	0.72	0.25	1.76	0.45	2.04	0.45	2.28	0.44	1.92	0.38	1.44	0.45
5	2.10	0.19	3.00	0.17	1.70	0.00	1.80	0.23	1.55	0.40	0.90	0.27	2.20	0.45	2.55	0.40	2.85	0.43	2.40	0.44	1.80	0.40
6	2.52	0.14	3.60	0.18	2.04	0.00	2.16	0.26	1.86	0.41	1.08	0.25	2.64	0.48	3.06	0.38	3.42	0.43	2.88	0.33	2.16	0.40
7	2.94	0.03	4.20	0.15	2.38	0.10	2.52	0.28	2.17	0.36	1.26	0.25	3.08	0.39	3.57	0.33	3.99	0.34	3.36	0.39	2.52	0.39
8	3.36	0.04	4.80	0.15	2.72	0.28	2.88	0.26	2.48	0.31	1.44	0.21	3.52	0.37	4.08	0.25	4.56	0.25	3.84	0.35	2.88	0.38
9	3.78	0.03	5.40	0.15	3.06	0.11	3.24	0.33	2.79	0.25	1.62	0.09	3.96	0.26	4.59	0.22	5.13	0.19	4.32	0.20	3.24	0.35
Right Bank	4.20	0.00	6.00	0.00	3.40	0.00	3.60	0.00	3.10	0.00	1.80	0.00	4.40	0.00	5.10	0.00	5.70	0.00	4.80	0.00	3.60	0.00
Feature Type (riffle, run, or pool)	Run		Run		Run		Run		Run		Run		Run		Run		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 corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine bv 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.

Surveyor's Signature: _____ Date: 10.06.08

WBID # 0604 ~~0607~~ 30

Site # 03

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: 10/06/08 10:50	Location Description (e.g., road crossing): Off of Sportsman Rd
Stream Name: Elk Cr	
Current Weather Conditions: Pt. Cldy, Calm, 70°F	Facility Name(s): Brookfield Swimming Pool, Brookfield SW, WWTF
Weather Conditions for Past 10 days: Clear, Light Rain 0.61"	Permit Number(s): MO 0046922, MO 0028738
Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought ☒; Phase I ☐; Phase II ☐; Phase III ☐; Phase IV ☐; Unknown ☐	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)				
Site 01	Easting (UTM X): 0490765	Northing (UTM Y): 4391727	Horizontal Accuracy: (EPE / FOM / PDOP) 15	~~Meters~~ ft
Site 11	Easting (UTM X): 0490746	Northing (UTM Y): 4391576	Horizontal Accuracy: (EPE / FOM / PDOP) 14	~~Meters~~ ft

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
0604_3_113	Upstream	0604_3_114	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.)

☐ Swimming	☐ Skin diving	☐ SCUBA diving	☐ Tubing	☐ Water skiing
☐ Wind surfing	☐ Kayaking	☐ Boating	☐ Wading	☐ Rafting
☐ Hunting	☐ Trapping	☐ Fishing	☒ None of the above	☐ 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.)

N/A

Stream Name & WBID # Elk Cr 0604 ~~0607~~ EMH Date of Survey 10/06/08

Site # 03

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.)

☐ City/county parks	☐ Playgrounds	☐ MDC conservation lands	☐ Urban areas	☒ Rural Residential
☐ Campgrounds	☐ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ Boating accesses	☐ Fence	☐ No trespass sign	☒ Steep slopes	☒ Other: Pasture Row Crop

Comments: private property

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

☐ Roads	☐ Foot paths/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
☐ RV / ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock Watering
☒ None of the above	Comments / Other: N/A			

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

5 % Cobble	5 % Gravel	10 % Sand	10 % Silt	70 % Mud/Clay	—— % Bedrock

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

Hydrilla, algal growth common

Water Characteristics*: (Mark all that apply.)

Odor:	☐ Sewage	☐ Musky	☐ Chemical	☒ None	☐ Other:
Color:	☐ Clear	☐ Green	☐ Gray	☐ Milky	☒ Other: Brown
Bottom Deposit:	☐ Sludge	☐ Solids	☒ Fine sediments	☐ None	☐ Other:
Surface Deposit:	☐ Oil	☐ Scum	☐ Foam	☒ None	☐ 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.

EMH

Stream Name & WBID # Elk Cr ~~0607~~ 0604 3V Date of Survey 10/06/08

Site # 03

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)
		N/A			

Comments: (Please record any additional comments here.)

N/A

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

Printed Names of Personnel Collecting Data: James VeVerka, Jennifer Hrabik

Surveyor's Signature: JsVeVerka Date of Survey: 10/06/08

Organization: MEC Water Position: Water Quality Scientist

BWC 10-16-08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: Elk Creek Waterbody ID: 0604 Site #: 0604_03

Estimated Channel Incision: 0.00 (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:	490765	UTM Y:	4391727	+/- 15	(feet)
11	UTM X:	490746	UTM Y:	4391576	+/- 14	(feet)

Average Stream Width: 7.0 (meters) (To determne Length of Reach)

Length of Survey Segment: 150 (meters) (20x average stream width)

Field Staff: JH, JV

Dissolved Oxygen

Date: 10.06.08 Time: 10:50

Dissolved Oxygen: 7.63 (mg/L)

Dissolved Oxygen: 80.1 (% sat)

Specific Cond: 448.1 (µS/cm)

Water Temperature: 17.6 (°C)

Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	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)
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	0.39	0.18	0.65	0.33	0.52	0.24	0.79	0.33	0.54	0.17	0.73	0.36	0.61	0.38	0.57	0.40	0.48	0.30	0.52	0.26	0.67	0.20
2	0.78	0.25	1.30	0.37	1.04	0.24	1.58	0.38	1.08	0.22	1.46	0.45	1.22	0.44	1.14	0.51	0.96	0.28	1.04	0.65	1.34	0.44
3	1.17	0.31	1.95	0.40	1.56	0.30	2.37	0.28	1.62	0.26	2.19	0.48	1.83	0.55	1.71	0.64	1.44	0.27	1.56	0.82	2.01	0.58
4	1.56	0.33	2.60	0.44	2.08	0.38	3.16	0.36	2.16	0.29	2.92	0.42	2.44	0.61	2.28	0.62	1.92	0.25	2.08	0.56	2.68	0.66
5	1.95	0.35	3.25	0.44	2.60	0.38	3.95	0.60	2.70	0.39	3.65	0.65	3.05	0.59	2.85	0.45	2.40	0.27	2.60	0.55	3.35	0.90
6	2.34	0.33	3.90	0.42	3.12	0.42	4.74	0.71	3.24	0.41	4.38	0.74	3.66	0.50	3.42	0.36	2.88	0.25	3.12	0.64	4.02	0.58
7	2.73	0.25	4.55	0.36	3.64	0.42	5.53	0.80	3.78	0.44	5.11	0.78	4.27	0.40	3.99	0.20	3.36	0.23	3.64	0.46	4.69	0.12
8	3.12	0.19	5.20	0.27	4.16	0.44	6.32	0.76	4.32	0.27	5.84	0.59	4.88	0.16	4.56	0.12	3.84	0.19	4.16	0.40	5.36	0.22
9	3.51	0.13	5.85	0.12	4.68	0.27	7.11	0.63	4.86	0.22	6.57	0.21	5.49	0.07	5.13	0.09	4.32	0.19	4.68	0.23	6.03	0.25
Right Bank	3.90	0.00	6.50	0.00	5.20	0.00	7.90	0.00	5.40	0.06	7.30	0.00	6.10	0.00	5.70	0.00	4.80	0.00	5.20	0.23	6.70	0.00
Feature Type (riffle, run, or pool)	Run		Run		Run		Pool		Run		Run		Run		Run		Run		Pool		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 corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine bv 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.

Surveyor's Signature: _____ Date: 10.06.08

WBID # ~~0607~~ 0604

Site # 04

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: 10/06/08 11:25	Location Description (e.g., road crossing): Off of Bushnell Rd
Stream Name: Elk Cr	
Current Weather Conditions: Cldy, Calm, 72°F	Facility Name(s): Brookfield Swimming Pool, Brookfield SW, WWTF
Weather Conditions for Past 10 days: Clear, Light Rain 0.61" rain	Permit Number(s): MO 0046922, MO 0028738
Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought ☒; Phase I ☐; Phase II ☐; Phase III ☐; Phase IV ☐; Unknown ☐	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)				
Site 01	Easting (UTM X): 0489557	Northing (UTM Y): 4390459	Horizontal Accuracy: (EPE / FOM / PDOP)	15 ~~Meters~~ 50 ft
Site 11	Easting (UTM X): 0489558	Northing (UTM Y): 4390288	Horizontal Accuracy: (EPE / FOM / PDOP)	14 ~~Meters~~ 50 ft

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
604_4_15	Up Stream	604_4_116	Down Stream		
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.)

☐ Swimming	☐ Skin diving	☐ SCUBA diving	☐ Tubing	☐ Water skiing
☐ Wind surfing	☐ Kayaking	☐ Boating	☐ Wading	☐ Rafting
☐ Hunting	☐ Trapping	☐ Fishing	☒ None of the above	☐ 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.)

N/A

Stream Name & WBID # Elk Cr ~~0607~~ 0604 SV Date of Survey 10/06/08

Site # 04

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.)

☐ City/county parks	☐ Playgrounds	☐ MDC conservation lands	☐ Urban areas	☒ Rural Residential
☐ Campgrounds	☐ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ Boating accesses	☐ Fence	☐ No trespass sign	☒ Steep slopes	☒ Other: Pasture & Row Crop

Comments: private property

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

☐ Roads	☐ Foot paths/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
☐ RV / ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock Watering
☒ None of the above	Comments / Other: N/A			

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

— % Cobble	— % Gravel	10 % Sand	10 % Silt	80 % Mud/Clay	— % Bedrock

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

Algal growth common

Water Characteristics*: (Mark all that apply.)

Odor:	☐ Sewage	☐ Musky	☐ Chemical	☒ None	☐ Other:
Color:	☐ Clear	☐ Green	☐ Gray	☐ Milky	☒ Other: Brown
Bottom Deposit:	☐ Sludge	☐ Solids	☒ Fine sediments	☐ None	☒ Other: Woody debris
Surface Deposit:	☐ Oil	☐ Scum	☐ Foam	☒ ~~None~~ SV	☒ Other: Sheen

*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.

Stream Name & WBID # Elk Cr 0604 ~~0607~~ JV Date of Survey 10/06/08

Site # 04

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)
		N/A			

Comments: (Please record any additional comments here.)

N/A

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

Printed Names of Personnel Collecting Data: James VeVecka, Jennifer Hrabik

Surveyor's Signature: [signature] Date of Survey: 10/06/08

Organization: MEC Water Position: Water Quality Scientist

QA'd 10-16-08

JRH

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: Elk Creek Waterbody ID: 0604 Site #: 0604_04

Estimated Channel Incision: 0.00 (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:	489557	UTM Y:	4390459	+/- 15	(feet)
11	UTM X:	489558	UTM Y:	4390288	+/- 14	(feet)

Average Stream Width: 9.0 (meters) (To determne Length of Reach)

Length of Survey Segment: 180 (meters) (20x average stream width)

Field Staff: JH, JV

Dissolved Oxygen

Date: 10.06.08 Time: 11:25

Dissolved Oxygen: 2.99 (mg/L)

Dissolved Oxygen: 32.1 (% sat)

Specific Cond: 429.9 (µS/cm)

Water Temperature: 18.3 (°C)

Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	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)
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	0.91	0.29	0.84	0.23	0.95	0.27	0.74	0.39	0.84	0.60	0.81	0.47	0.89	0.29	0.90	0.34	0.94	0.32	1.10	0.32	1.08	0.37
2	1.82	0.60	1.68	0.44	1.90	0.40	1.48	0.76	1.68	0.72	1.62	0.60	1.78	0.40	1.80	0.45	1.88	0.65	2.20	0.49	2.16	0.56
3	2.73	0.75	2.52	0.65	2.85	0.54	2.22	0.92	2.52	0.75	2.43	0.81	2.67	0.53	2.70	0.70	2.82	0.86	3.30	0.43	3.24	0.66
4	3.64	0.68	3.36	0.67	3.80	0.65	2.96	0.90	3.36	0.86	3.24	0.82	3.56	0.68	3.60	>1.00	3.76	0.96	4.40	0.78	4.32	0.83
5	4.55	0.60	4.20	0.75	4.75	0.70	3.70	0.89	4.20	0.88	4.05	0.98	4.45	0.80	4.50	>1.00	4.70	0.96	5.50	0.90	5.40	0.88
6	5.46	0.55	5.04	0.75	5.70	0.68	4.44	0.94	5.04	0.90	4.86	>1.00	5.34	0.93	5.40	>1.00	5.64	0.99	6.60	0.68	6.48	0.90
7	6.37	0.60	5.88	0.70	6.65	0.65	5.18	0.96	5.88	0.89	5.67	0.84	6.23	0.80	6.30	>1.00	6.58	0.92	7.70	0.65	7.56	0.84
8	7.28	0.49	6.72	0.74	7.60	0.55	5.92	0.83	6.72	0.74	6.48	0.79	7.12	0.70	7.20	0.78	7.52	0.80	8.80	0.68	8.64	0.80
9	8.19	0.29	7.56	0.65	8.55	0.41	6.66	0.60	7.56	0.53	7.29	0.64	8.01	0.40	8.10	0.50	8.46	0.43	9.90	0.50	9.72	0.59
Right Bank	9.10	0.00	8.40	0.00	9.50	0.00	7.40	0.00	8.40	0.00	8.10	0.00	8.90	0.00	9.00	0.00	9.40	0.00	11.00	0.00	10.80	0.00
Feature Type (riffle, run, or pool)	Run		Run		Run		Run		Run		Run		Run		Pool		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 corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine bv 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.

Surveyor's Signature: _____ Date: 10.06.08

WBID # ~~0607~~ 8P 0604

Site # 05

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: 10/06/08 12:00	Location Description (e.g., road crossing): 055 of Fulbright
Stream Name: Elk Cr	
Current Weather Conditions: Pt. Cldy Calm, 72°F	Facility Name(s): Brookfield Swimming Pool, Brookfield SW, WWTF
Weather Conditions for Past 10 days: 0.61" of rain	Permit Number(s): MO 0046922, MO 0028738
Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought ☒; Phase I ☐; Phase II ☐; Phase III ☐; Phase IV ☐; Unknown ☐	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)				
Site 01	Easting (UTM X): 0489115	Northing (UTM Y): 4390094	Horizontal Accuracy: (EPE / FOM / PDOP)	15 ~~Meters~~ ft JEH
Site 11	Easting (UTM X): 0489030	Northing (UTM Y): 4389966	Horizontal Accuracy: (EPE / FOM / PDOP)	17 ~~Meters~~ ft JEH

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
604_S_117	Upstream	604_S_118	Down Stream		
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.)

☐ Swimming	☐ Skin diving	☐ SCUBA diving	☐ Tubing	☐ Water skiing
☐ Wind surfing	☐ Kayaking	☐ Boating	☐ Wading	☐ Rafting
☐ Hunting	☐ Trapping	☐ Fishing	☒ None of the above	☐ 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.)

N/A

Stream Name & WBID # Elk Cr ~~0607~~ SV 0604 Date of Survey 10/06/08

Site # 05

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.)

☐ City/county parks	☐ Playgrounds	☐ MDC conservation lands	☐ Urban areas	☒ Rural Residential
☐ Campgrounds	☐ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ Boating accesses	☐ Fence	☒ No trespass sign	☒ Steep slopes	☒ Other: Pasture & Row Crop
Comments: private property				

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

☐ Roads	☐ Foot paths/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
☐ RV / ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock Watering
☒ None of the above	Comments / Other: N/A			

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

— % Cobble	5 % Gravel	~~10~~ SV 5 % Sand	10 % Silt	80 % Mud/Clay	— % Bedrock

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

~~None~~ SV filamentous algal growth uncommon

Water Characteristics*: (Mark all that apply.)

Odor:	☐ Sewage	☐ Musky	☐ Chemical	☒ None	☐ Other:
Color:	☐ Clear	☐ Green	☐ Gray	☐ Milky	☒ Other: Brown
Bottom Deposit:	☐ Sludge	☐ Solids	☒ Fine sediments	☐ None	☐ Other:
Surface Deposit:	☐ Oil	☐ Scum	☐ Foam	☒ None	☐ 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.

Stream Name & WBID # Elk Cr ~~0607~~ 0604 SV Date of Survey 10/06/08

Site # 05

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)
		N/A			

Comments: (Please record any additional comments here.)

N/A

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

Printed Names of Personnel Collecting Data: James VeVerka, Jennifer Hrabik

Surveyor's Signature: JsVeVerka Date of Survey: 10/06/08

Organization: MEC Water Position: Water Quality Scientist

QWC 10-16-08

JVEH

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: Elk Creek Waterbody ID: 0604 Site #: 0604_05

Estimated Channel Incision: 0.00 (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:	489115	UTM Y:	4390094	+/- 13	(feet)
11	UTM X:	489030	UTM Y:	4389966	+/- 17	(feet)

Average Stream Width: 9.0 (meters) (To determne Length of Reach)

Length of Survey Segment: 180 (meters) (20x average stream width)

Field Staff: JH, JV

Dissolved Oxygen

Date: 10.06.08 Time: 12:00

Dissolved Oxygen: 5.51 (mg/L)

Dissolved Oxygen: 60.2 (% sat)

Specific Cond: 362.3 (µS/cm)

Water Temperature: 19.5 (°C)

Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	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)
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	1.30	0.84	1.32	0.65	0.92	0.75	0.95	0.84	0.91	>1.00	0.90	>1.00	0.87	>1.00	0.96	>1.00	0.92	>1.00	0.90	0.70	0.94	0.40
2	2.60	>1.00	2.64	0.60	1.84	>1.00	1.90	>1.00	1.82	>1.00	1.80	>1.00	1.74	>1.00	1.92	>1.00	1.84	>1.00	1.80	>1.00	1.88	>1.00
3	3.90	>1.00	3.96	0.46	2.76	>1.00	2.85	>1.00	2.73	>1.00	2.70	>1.00	2.61	>1.00	2.88	>1.00	2.76	>1.00	2.70	>1.00	2.82	>1.00
4	5.20	>1.00	5.28	0.35	3.68	>1.00	3.80	>1.00	3.64	>1.00	3.60	>1.00	3.48	>1.00	3.84	>1.00	3.68	>1.00	3.60	>1.00	3.76	>1.00
5	6.50	>1.00	6.60	0.22	4.60	>1.00	4.75	>1.00	4.55	>1.00	4.50	>1.00	4.35	>1.00	4.80	>1.00	4.60	>1.00	4.50	>1.00	4.70	>1.00
6	7.80	>1.00	7.92	0.36	5.52	>1.00	5.70	>1.00	5.46	>1.00	5.40	>1.00	5.22	>1.00	5.76	>1.00	5.52	>1.00	5.40	>1.00	5.64	>1.00
7	9.10	>1.00	9.24	0.65	6.44	>1.00	6.65	>1.00	6.37	>1.00	6.30	0.95	6.09	>1.00	6.72	>1.00	6.44	>1.00	6.30	>1.00	6.58	>1.00
8	10.40	>1.00	10.56	0.63	7.36	0.73	7.60	>1.00	7.28	0.60	7.20	0.89	6.96	>1.00	7.68	>1.00	7.36	>1.00	7.20	>1.00	7.52	>1.00
9	11.70	0.72	11.88	0.48	8.28	0.54	8.55	0.79	8.19	0.54	8.10	0.60	7.83	0.39	8.64	>1.00	8.28	>1.00	8.10	0.75	8.46	0.84
Right Bank	13.00	0.00	13.20	0.00	9.20	0.00	9.50	0.00	9.10	0.00	9.00	0.00	8.70	0.00	9.60	0.00	9.20	0.00	9.00	0.00	9.40	0.00
Feature Type (riffle, run, or pool)	Pool		Run		Run		Run		Pool		Run		Run		Run		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 corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine bv 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.

Surveyor's Signature: _____ Date: 10.06.08

WBID # ~~0607~~ BV 0604

Site # 06

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: 10/06/08 12:35	Location Description (e.g., road crossing): Off of Route E
Stream Name: Elk Cr	
Current Weather Conditions: Overcast, Calm, 75°F	Facility Name(s): Brookfield Swimming Pool / Brookfield SW WWTF
Weather Conditions for Past 10 days: 0.61" of rain	Permit Number(s): MO 0041622 / MO 0028738
Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought ☒; Phase I ☐; Phase II ☐; Phase III ☐; Phase IV ☐; Unknown ☐	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)					
Site 01	Easting (UTM X): 0488067	Northing (UTM Y): 4387585	Horizontal Accuracy: (EPE / FOM / PDOP)	18 ~~Meters~~ JCH	f1
Site 11	Easting (UTM X): 0487905	Northing (UTM Y): ~~4387427~~ 4387487 JCH	Horizontal Accuracy: (EPE / FOM / PDOP)	20 ~~Meters~~ JCH	f1

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
0604-6-119	Up Stream	0604-6-120	Down Stream		
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.)

☐ Swimming	☐ Skin diving	☐ SCUBA diving	☐ Tubing	☐ Water skiing
☐ Wind surfing	☐ Kayaking	☐ Boating	☐ Wading	☐ Rafting
☐ Hunting	☐ Trapping	☐ Fishing	☒ None of the above	☐ 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.)

N/A

Stream Name & WBID # Elk Cr ~~0604~~ 3V 0604 Date of Survey 10/06/08

Site # 06

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.)

☐ City/county parks	☐ Playgrounds	☒ MDC conservation lands	☐ Urban areas	☒ Rural Residential
☐ Campgrounds	☐ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ Boating accesses	☐ Fence	☐ No trespass sign	☒ Steep slopes	☒ Other: Row Crop
Comments: Conservation land – Swan Lake NWR				

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

☐ Roads	☐ Foot paths/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
☐ RV / ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock Watering
☒ None of the above	Comments / Other:			

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

— % Cobble	— % Gravel	10 % Sand	10 % Silt	80 % Mud/Clay	— % Bedrock

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

uncommon algal growth

Water Characteristics*: (Mark all that apply.)

Odor:	☐ Sewage	☐ Musky	☐ Chemical	☒ None	☐ Other:
Color:	☐ Clear	☐ Green	☐ Gray	☐ Milky	☒ Other: Brown
Bottom Deposit:	☐ Sludge	☐ Solids	☒ Fine sediments	☐ None	☐ Other:
Surface Deposit:	☐ Oil	☐ Scum	☐ Foam	☒ None	☐ 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.

Stream Name & WBID # Elk Cr 0604 ~~0607~~ SW

Site # 06

Date of Survey 10/06/08

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)
		N/A			

Comments: (Please record any additional comments here.)

N/A

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

Printed Names of Personnel Collecting Data: Jennifer Habick + James VeVerka

Surveyor's Signature: Jennifer Habick Date of Survey: 10/6/08

Organization: AE Solutions Position: Environmental Specialist

AWC 10-16-08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: Elk Creek Waterbody ID: 0604 Site #: 0604_06

Estimated Channel Incision: 0.00 (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:	488067	UTM Y:	4387585	+/- 18	(feet)
11	UTM X:	487905	UTM Y:	4387427	+/- 20	(feet)

Average Stream Width: 13.0 (meters) (To determne Length of Reach)

Length of Survey Segment: 260 (meters) (20x average stream width)

Field Staff: JH, JV

Dissolved Oxygen

Date: 10/6/2008 Time: 12:35

Dissolved Oxygen: 2.83 (mg/L)

Dissolved Oxygen: 29.9 (% sat)

Specific Cond: 249.7 (µS/cm)

Water Temperature: 18.2 (°C)

Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	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)
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	1.40	>1.00	1.88	>1.00	1.10	>1.00	1.25	>1.00	1.25	>1.00	1.30	>1.00	1.36	>1.00	1.26	>1.00	1.26	>1.00	1.30	>1.00	1.35	>1.00
2	2.80	>1.00	3.76	>1.00	2.20	>1.00	2.50	>1.00	2.50	>1.00	2.60	>1.00	2.72	>1.00	2.52	>1.00	2.52	>1.00	2.60	>1.00	2.70	>1.00
3	4.20	>1.00	5.64	>1.00	3.30	>1.00	3.75	>1.00	3.75	>1.00	3.90	>1.00	4.08	>1.00	3.78	>1.00	3.78	>1.00	3.90	>1.00	4.05	>1.00
4	5.60	>1.00	7.52	>1.00	4.40	>1.00	5.00	>1.00	5.00	>1.00	5.20	>1.00	5.44	>1.00	5.04	>1.00	5.04	>1.00	5.20	>1.00	5.40	>1.00
5	7.00	>1.00	9.40	>1.00	5.50	>1.00	6.25	>1.00	6.25	>1.00	6.50	>1.00	6.80	>1.00	6.30	>1.00	6.30	>1.00	6.50	>1.00	6.75	>1.00
6	8.40	>1.00	11.28	>1.00	6.60	>1.00	7.50	>1.00	7.50	>1.00	7.80	>1.00	8.16	>1.00	7.56	>1.00	7.56	>1.00	7.80	>1.00	8.10	>1.00
7	9.80	>1.00	13.16	>1.00	7.70	>1.00	8.75	>1.00	8.75	>1.00	9.10	>1.00	9.52	>1.00	8.82	>1.00	8.82	>1.00	9.10	>1.00	9.45	>1.00
8	11.20	>1.00	15.04	>1.00	8.80	>1.00	10.00	>1.00	10.00	>1.00	10.40	>1.00	10.88	>1.00	10.08	>1.00	10.08	>1.00	10.40	>1.00	10.80	>1.00
9	12.60	>1.00	16.92	>1.00	9.90	>1.00	11.25	>1.00	11.25	>1.00	11.70	>1.00	12.24	>1.00	11.34	>1.00	11.34	>1.00	11.70	>1.00	12.15	>1.00
Right Bank	14.00	0.00	18.80	0.00	11.00	0.00	12.50	0.00	12.50	0.00	13.00	0.00	13.60	0.00	12.60	0.00	12.60	0.00	13.00	0.00	13.50	0.00
Feature Type (riffle, run, or pool)	Run		Run		Run		Run		Run		Run		Run		Run		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 corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine bv 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.

Surveyor's Signature: _____ Date: 10/6/2008

WBID # 604 ~~0607~~

Site # 07

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: 10/06/08 12:53	Location Description (e.g., road crossing): South of Route E (50m downstream of site 6)
Stream Name: Elk Cr	
Current Weather Conditions: Overcast, Breezy, 75°F	Facility Name(s): Brookfield Swimming Pool / Brookfield SW WWTF
Weather Conditions for Past 10 days: 0.61" of rain	Permit Number(s): MO 0046922 / MO 0028738
Official Drought Conditions at time of this survey (search DNR home page for "drought"): No drought ☒; Phase I ☐; Phase II ☐; Phase III ☐; Phase IV ☐; Unknown ☐	

Site Location:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)				
Site 01	Easting (UTM X): 487785	Northing (UTM Y): 4387332	Horizontal Accuracy: (EPE / FOM / PDOP)	20 ~~Meters~~ ft
Site 11	Easting (UTM X): 487570	Northing (UTM Y): 4387188	Horizontal Accuracy: (EPE / FOM / PDOP)	20 ~~Meters~~ ft

Photos:

Photo ID#	Photo Purpose	Photo ID#	Photo Purpose	Photo ID#	Photo Purpose
604_7_121	Up Stream	604_7_122	Down Stream		
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.)

☐ Swimming	☐ Skin diving	☐ SCUBA diving	☐ Tubing	☐ Water skiing
☐ Wind surfing	☐ Kayaking	☐ Boating	☐ Wading	☐ Rafting
☐ Hunting	☐ Trapping	☐ Fishing	☒ None of the above	☐ 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.)

N/A

Stream Name & WBID # Elk Cr ~~0607~~ 0604 30 Date of Survey 10/06/08

Site # 07

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.)

☐ City/county parks	☐ Playgrounds	☒ MDC conservation lands	☐ Urban areas	☐ Rural Residential
☐ Campgrounds	☐ State parks	☐ National forests	☐ Nature trails	☐ Stairs/walkway
☐ Boating accesses	☐ Fence	☐ No trespass sign	☒ Steep slopes	☐ Other:
Comments: Conservation area - Swan Lake NWR				

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

☐ Roads	☐ Foot paths/prints	☐ Dock/platform	☐ Camping Sites	☐ Rope swings
☐ RV / ATV Tracks	☐ Fire pit/ring	☐ NPDES Discharge	☐ Fishing Tackle	☐ Livestock Watering
☒ None of the above	Comments / Other: N/A			

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

— % Cobble	— % Gravel	10 % Sand	10 % Silt	80 % Mud/Clay	— % Bedrock

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

Uncommon algal growth

Water Characteristics*: (Mark all that apply.)

Odor:	☐ Sewage	☐ Musky	☐ Chemical	☒ None	☐ Other:
Color:	☐ Clear	☐ Green	☐ Gray	☐ Milky	☒ Other: Brown
Bottom Deposit:	☐ Sludge	☐ Solids	☒ Fine sediments	☐ None	☐ Other:
Surface Deposit:	☐ Oil	☐ Scum	☐ Foam	☒ None	☐ 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.

Stream Name & WBID # Elk Cr ~~0607~~ 0604 Date of Survey 10/06/08

Site # 07

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.)

N/A

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

Printed Names of Personnel Collecting Data: Jennifer Hrabik + James VeVerka

Surveyor's Signature: Jennifer Hrabik Date of Survey: 10/16/08

Organization: AE Solutions Position: Environmental Specialist

QAW 10-16-08

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet C - Field Survey Results

Stream Name: Elk Creek Waterbody ID: 0604 Site #: 0604_07

Estimated Channel Incision: 0.00 (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:	487785	UTM Y:	4387332	+/- 20	(feet)
11	UTM X:	487570	UTM Y:	4387188	+/- 20	(feet)

Average Stream Width: 13.0 (meters) (To determne Length of Reach)

Length of Survey Segment: 260 (meters) (20x average stream width)

Field Staff: JH, JV

Dissolved Oxygen

Date: 10/6/2008 Time: 12:53

Dissolved Oxygen: 2.87 (mg/L)

Dissolved Oxygen: 30.9 (% sat)

Specific Cond: 229.6 (µS/cm)

Water Temperature: 18.9 (°C)

Transect Cross-Section

Station	01		02		03		04		05		06		07		08		09		10		11	
	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)
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	1.30	>1.00	1.28	>1.00	1.31	>1.00	1.31	>1.00	1.31	>1.00	1.25	>1.00	1.20	>1.00	1.13	>1.00	1.00	>1.00	1.10	>1.00	1.12	>1.00
2	2.60	>1.00	2.56	>1.00	2.62	>1.00	2.62	>1.00	2.62	>1.00	2.50	>1.00	2.40	>1.00	2.26	>1.00	2.00	>1.00	2.20	>1.00	2.24	>1.00
3	3.90	>1.00	3.84	>1.00	3.93	>1.00	3.93	>1.00	3.93	>1.00	3.75	>1.00	3.60	>1.00	3.39	>1.00	3.00	>1.00	3.30	>1.00	3.36	>1.00
4	5.20	>1.00	5.12	>1.00	5.24	>1.00	5.24	>1.00	5.24	>1.00	5.00	>1.00	4.80	>1.00	4.52	>1.00	4.00	>1.00	4.40	>1.00	4.48	>1.00
5	6.50	>1.00	6.40	>1.00	6.55	>1.00	6.55	>1.00	6.55	>1.00	6.25	>1.00	6.00	>1.00	5.65	>1.00	5.00	>1.00	5.50	>1.00	5.60	>1.00
6	7.80	>1.00	7.68	>1.00	7.86	>1.00	7.86	>1.00	7.86	>1.00	7.50	>1.00	7.20	>1.00	6.78	>1.00	6.00	>1.00	6.60	>1.00	6.72	>1.00
7	9.10	>1.00	8.96	>1.00	9.17	>1.00	9.17	>1.00	9.17	>1.00	8.75	>1.00	8.40	>1.00	7.91	>1.00	7.00	>1.00	7.70	>1.00	7.84	>1.00
8	10.40	>1.00	10.24	>1.00	10.48	>1.00	10.48	>1.00	10.48	>1.00	10.00	>1.00	9.60	>1.00	9.04	>1.00	8.00	>1.00	8.80	>1.00	8.96	>1.00
9	11.70	>1.00	11.52	>1.00	11.79	>1.00	11.79	>1.00	11.79	>1.00	11.25	>1.00	10.80	>1.00	10.17	>1.00	9.00	>1.00	9.90	>1.00	10.08	>1.00
Right Bank	13.00	0.00	12.80	0.00	13.10	0.00	13.10	0.00	13.10	0.00	12.50	0.00	12.00	0.00	11.30	0.00	10.00	0.00	11.00	0.00	11.20	0.00
Feature Type (riffle, run, or pool)	Run		Run		Run		Run		Run		Run		Run		Run		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 corresponds to Transect 01 and 11. Transects ordered in upstream to downstream order.

Depth measurements taken at 10 equally spaced locations along transect (determine bv 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.

Surveyor's Signature: _____ Date: 10/6/2008

WBID #0604

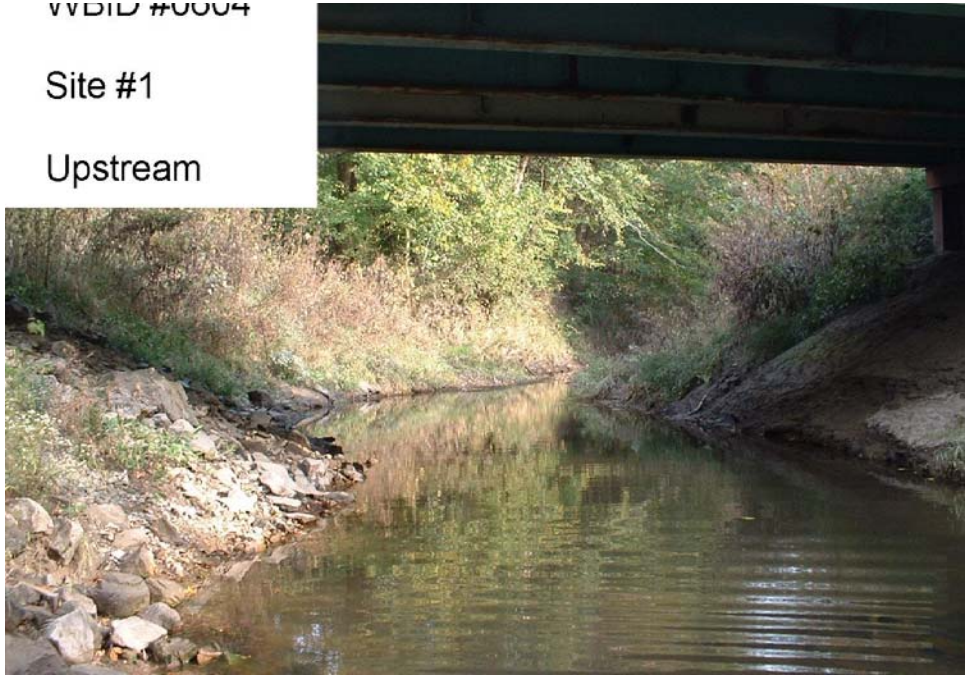
Site #1

Downstream

WBID #0604

Site #1

Upstream



WBID #0604
Site #3
Dostream

WBID #0604
Site #4
Downstream

WBID #0604
Site #3
Dostream

WBID #0604
Site #4
Upstream

WBID #0004

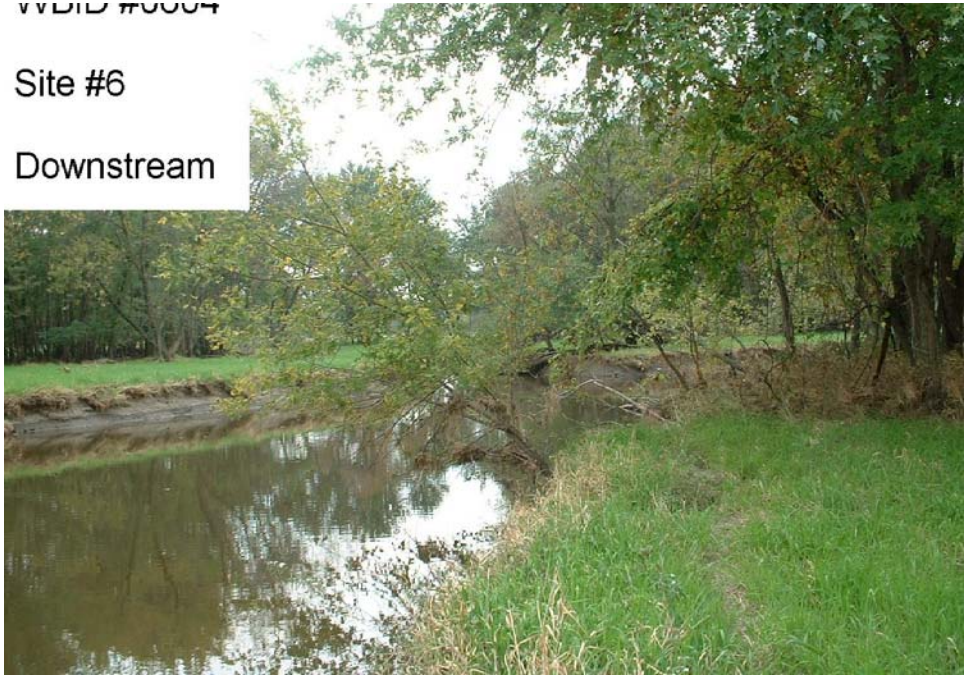
Site #5

Downstream

WBID #0004

Site #6

Downstream



WBID #0004

Site #5

Upstream

WBID #0004

Site #6

Upstream

WBID #0004

Site #7

Downstream

WBID #0004

Site #7

Upstream