Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 77.75

Stream & Location: Cuyahoga River (DS of Tinkers Creek) **RM:** 16.20 **Date:** 09/24/15

J. Knittle, T. Sablotny **Scorers Full Name & Affiliation:** Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 41.3678 / 81.6139 **Office verified location** ☐

1] SUBSTRATE

Check *ONLY* Two substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR/SLABS [10]	✓		☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]	✓		☐ ☐ DETRITUS [3]		
☐ ☐ COBBLE [8]	✓	✓	☐ ☐ MUCK [2]		
☐ ■ GRAVEL [7]	✓	✓	☐ ☐ SILT [2]	✓	✓
■ ☐ SAND [6]	✓	✓	☐ ☐ ARTIFICIAL [0]	✓	✓
☐ ☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ■ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN		QUALITY	
☐ LIMESTONE [1]	SILT	☐ HEAVY [-2]	Substrate
■ TILLS [1]		☐ MODERATE [-1]	15.5
☐ WETLANDS [0]		■ NORMAL [0]	
☐ HARDPAN [0]		☐ FREE [1]	
☐ SANDSTONE [0]	EMBEDDEDNESS	☐ EXTENSIVE [-2]	Maximum 20
☐ RIP/RAP [0]		■ MODERATE [-1]	
☐ LACUSTURINE [0]		■ NORMAL [0]	
☐ SHALE [-1]		☐ NONE [1]	
☐ COAL FINES [-2]			

Comments

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

1 UNDERCUT BANKS [1]	1 POOLS > 70cm [2]	2 OXBOWS, BACKWATERS [1]
1 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	1 AQUATIC MACROPHYTES [1]
1 SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]
1 ROOTMATS [1]		

AMOUNT Check ONE (*Or 2 & average*)

☐ EXTENSIVE >75% [11]
■ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover Maximum 20: 17

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	■ EXCELLENT [7]	☐ NONE [6]	■ HIGH [3]
☐ MODERATE [3]	■ GOOD [5]	■ RECOVERED [4]	■ MODERATE [2]
■ LOW [2]	☐ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel Maximum 20: 14.5

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for *EACH BANK* (*Or 2 per bank & average*)

River right looking downstream

EROSION (L / R)	RIPARIAN WIDTH (L / R)	FLOOD PLAIN QUALITY (L / R)
■ ■ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	■ ☐ FOREST, SWAMP [3]
☐ ■ MODERATE [2]	☐ ☐ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]
☐ ☐ HEAVY / SEVERE [1]	☐ ☐ NARROW 5-10m [2]	☐ ■ RESIDENTIAL, PARK, NEW FIELD [1]
	■ ■ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]
	■ ■ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]
		☐ ☐ CONSERVATION TILLAGE [1]
		☐ ☐ URBAN OR INDUSTRIAL [0]
		☐ ☐ MINING / CONSTRUCTION [0]

2.75 .5 0

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian Maximum 10: 5.25

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (*ONLY!*)

■ > 1m [6]
☐ 0.7-<1m [4]
☐ 0.4-<0.7m [2]
☐ 0.2-<0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (*Or 2 & average*)

☐ POOL WIDTH > RIFFLE WIDTH [2]
■ POOL WIDTH = RIFFLE WIDTH [1]
■ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply

☐ TORRENTIAL [-1]	■ SLOW [1]
☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
■ FAST [1]	☐ INTERMITTENT [-2]
■ MODERATE [1]	■ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current Maximum 12: 10.5

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
■ BEST AREAS > 10cm [2]	■ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	■ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	■ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run Maximum 8: 5

6] GRADIENT

(3.15 ft/mi)

DRAINAGE AREA (696 mi²)

☐ VERY LOW - LOW [2-4]
■ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: %GLIDE: %RUN: %RIFFLE:

Gradient Maximum 10: 10

A] SAMPLED REACH
Check ALL that apply

METHOD
- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE
1st -sample pass- 2nd
- ☐ HIGH ☐
- ☐ UP ☐
- ☐ NORMAL ☐
- ☐ LOW ☐
- ☐ DRY ☐

DISTANCE
- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY
1st --sample pass-- 2nd
- ☐ < 20 cm ☐
- ☐ 20-<40 cm ☐
- ☐ 40-70 cm ☐
- ☐ > 70 cm/ CTB ☐
- ☐ SECCHI DEPTH ☐

1st pass _______ cm
2nd pass _______ cm

CANOPY
- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS
- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION AREA DEPTH
POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE
PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

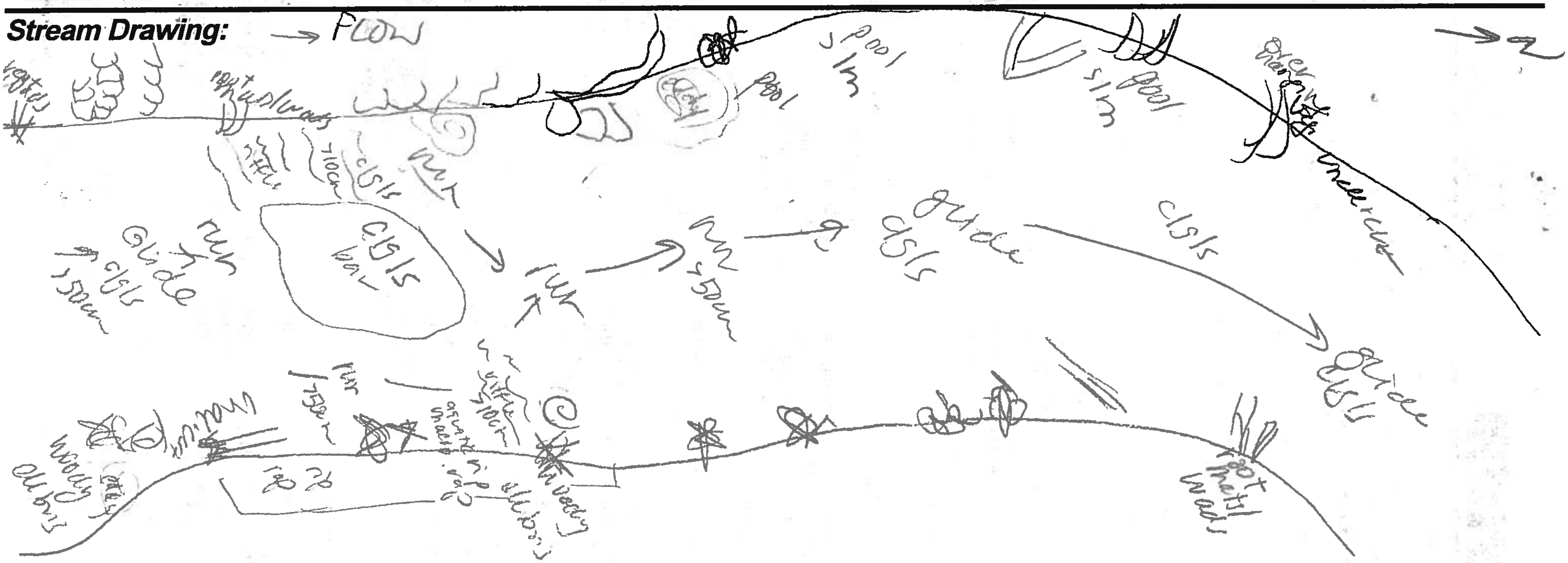
Circle some & *COMMENT*

E] ISSUES
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_2O / TILE / H_2O TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS
- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 67.5

Stream & Location: CUYAHOGA RIVER - I-480 RM: 12.10 Date: 8/13/15

CATHY ZAMBORSKY, (KNIGHT, RIVERA) Scorers Full Name & Affiliation: Northeast Ohio Regional Sewer District

River Code: ___-___-___ STORET #: _____ Lat./Long.: 41.4101 181.6346 (NAD 83 - decimal °) Office verified location ☐

1] SUBSTRATE

Check *ONLY* Two substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]	✓		☐☐ DETRITUS [3]		
☐☐ COBBLE [8]	✓	✓	☐☐ MUCK [2]		
☐■ GRAVEL [7]	✓	✓	☐☐ SILT [2]	✓	✓
☐■ SAND [6]	✓	✓	☐☐ ARTIFICIAL [0]		
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ■ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ■ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ■ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ■ MODERATE [-1]
- ■ NORMAL [0]
- ☐ NONE [1]

Substrate: 14.5 Maximum 20

Comments

2] INSTREAM COVER

Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

- 1 UNDERCUT BANKS [1]
- 0 OVERHANGING VEGETATION [1]
- 0 SHALLOWS (IN SLOW WATER) [1]
- 0 ROOTMATS [1]
- 2 POOLS > 70cm [2]
- 1 ROOTWADS [1]
- 0 BOULDERS [1]
- 0 OXBOWS, BACKWATERS [1]
- 0 AQUATIC MACROPHYTES [1]
- 1 LOGS OR WOODY DEBRIS [1]

AMOUNT

Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ■ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

Cover Maximum 20: 8

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	■ NONE [6]	■ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☐ MODERATE [2]
☐ LOW [2]	■ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
■ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments: Good Pools / No well defined riffles ↓ SAME HABITAT EACH YEAR

Channel Maximum 20: 13

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for *EACH BANK* (*Or 2 per bank & average*)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	
■■ NONE / LITTLE [3]	☐☐ WIDE > 50m [4]	☐☐ FOREST, SWAMP [3]	☐☐ CONSERVATION TILLAGE [1]
■■ MODERATE [2]	☐☐ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]	■■ URBAN OR INDUSTRIAL [0]
☐☐ HEAVY / SEVERE [1]	■■ NARROW 5-10m [2]	☐☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐☐ MINING / CONSTRUCTION [0]
	☐☐ VERY NARROW < 5m [1]	☐☐ FENCED PASTURE [1]	
	☐☐ NONE [0]	☐☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian

Comments

Riparian Maximum 10: 4.5

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH — Check ONE (*ONLY!*)
- ■ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH — Check ONE (*Or 2 & average*)
- ■ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY — Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ■ FAST [1]
- ■ MODERATE [1]
- ■ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ■ EDDIES [1]

Indicate for reach - pools and riffles

Recreation Potential: *Primary Contact* / *Secondary Contact* (circle one and comment on back)

Comments: FLOW STRONG BECAUSE OF DEPTH ↑

Pool / Current Maximum 12: 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
■ BEST AREAS > 10cm [2]	■ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	■ MOD. STABLE (e.g., Large Gravel) [1]	■ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	■ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run Maximum 8: 5.5

6] GRADIENT

(6.93 ft/mi) DRAINAGE AREA (709.00 mi²)

☐ VERY LOW - LOW [2-4]
☐ MODERATE [6-10]
■ HIGH - VERY HIGH [10-6]

%POOL: %GLIDE: %RUN: %RIFFLE:

Gradient Maximum 10: 10

EPA 4520 06/16/06

A] SAMPLE REACH

Check All that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

1st pass _____ cm

2nd _____ cm

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

Comment RE: Reach consistency/ Is reach typical of steam?. *Re[illegible]tion/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directi[illegible]tc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

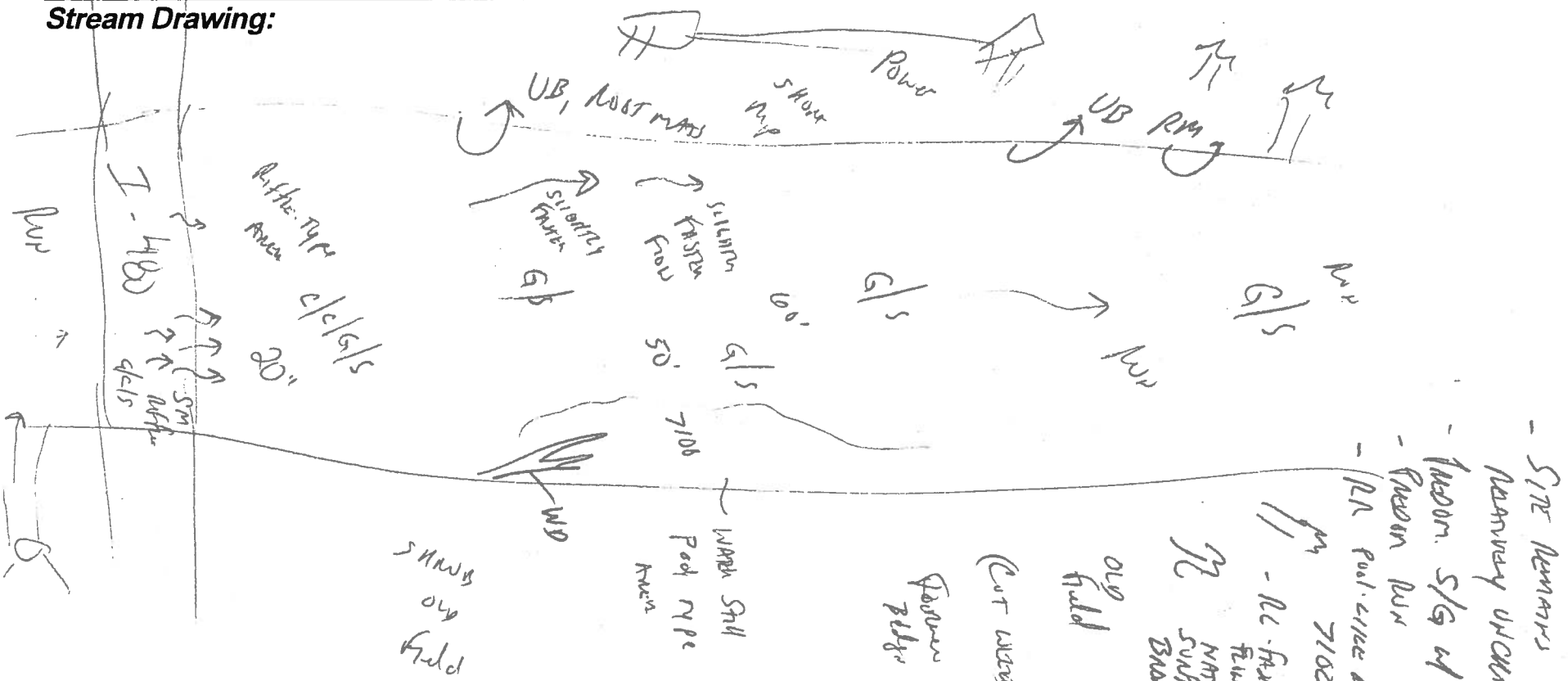
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 72

Stream & Location: Cuyahoga River (DS of Mill Creek) **RM:** 11.30 **Date:** 09/22/15

J. Knittle / (T. Zablotny) *Scorers Full Name & Affiliation:* Northeast Ohio Regional Sewer District

River Code: __-___-___ *STORET #:* ______ *Lat./Long.:* (NAD 83 - decimal °) 41.4179 / 81.6446 *Office verified location* ☐

1] SUBSTRATE

Check *ONLY* Two substrate *TYPE BOXES*; estimate % or note every type present. Check ONE (*Or 2 & average*)

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]	✓		☐☐ HARDPAN [4]		
☐☐ BOULDER [9]	✓	✓	☐☐ DETRITUS [3]		
☐☐ COBBLE [8]	✓	✓	☐☐ MUCK [2]		
☐■ GRAVEL [7]	✓	✓	☐☐ SILT [2]	✓	✓
■☐ SAND [6]	✓	✓	☐☐ ARTIFICIAL [0]	✓	✓
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ■ 4 or more [2] ☐ 3 or less [0]

Comments

ORIGIN
- ☐ LIMESTONE [1]
- ■ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ■ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ■ MODERATE [-1]
- ■ NORMAL [0]
- ☐ NONE [1]

Substrate 14.5 — Maximum 20

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

- 1 UNDERCUT BANKS [1]
- 1 OVERHANGING VEGETATION [1]
- 1 SHALLOWS (IN SLOW WATER) [1]
- 1 ROOTMATS [1]
- 1 POOLS > 70cm [2]
- 1 ROOTWADS [1]
- 1 BOULDERS [1]
- 0 OXBOWS, BACKWATERS [1]
- 0 AQUATIC MACROPHYTES [1]
- 1 LOGS OR WOODY DEBRIS [1]

AMOUNT Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ■ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

Cover 12 — Maximum 20

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	■ NONE [6]	■ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	■ MODERATE [2]
■ LOW [2]	■ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel 13.5 — Maximum 20

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for *EACH BANK* (*Or 2 per bank & average*)

River right looking downstream

EROSION (L R)
- ■■ NONE / LITTLE [3]
- ■☐ MODERATE [2]
- ☐☐ HEAVY / SEVERE [1]

2.75

RIPARIAN WIDTH (L R)
- ☐☐ WIDE > 50m [4]
- ☐☐ MODERATE 10-50m [3]
- ■■ NARROW 5-10m [2]
- ☐■ VERY NARROW < 5m [1]
- ☐☐ NONE [0]

1.75

FLOOD PLAIN QUALITY (L R)
- ☐☐ FOREST, SWAMP [3]
- ☐☐ SHRUB OR OLD FIELD [2]
- ☐■ RESIDENTIAL, PARK, NEW FIELD [1]
- ☐☐ FENCED PASTURE [1]
- ☐☐ OPEN PASTURE, ROWCROP [0]
- ☐☐ CONSERVATION TILLAGE [1]
- ■■ URBAN OR INDUSTRIAL [0]
- ☐☐ MINING / CONSTRUCTION [0]

0.5

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 5 — Maximum 10

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (*ONLY!*)
- ■ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (*Or 2 & average*)
- ■ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ■ FAST [1]
- ■ MODERATE [1]
- ■ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ■ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 12 — Maximum 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ■ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ■ MAXIMUM > 50cm [2]
- ☐ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ■ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ■ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run 5 — Maximum 8

6] GRADIENT

GRADIENT (4.77 ft/mi)
DRAINAGE AREA (730 mi²)

- ☐ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ■ HIGH - VERY HIGH [10-6]

%POOL: ___ %GLIDE: ___
%RUN: ___ %RIFFLE: ___

Gradient 10 — Maximum 10

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st –sample pass–	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

1st pass _____ cm

2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

POOL: AREA ☐ >100ft² DEPTH ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

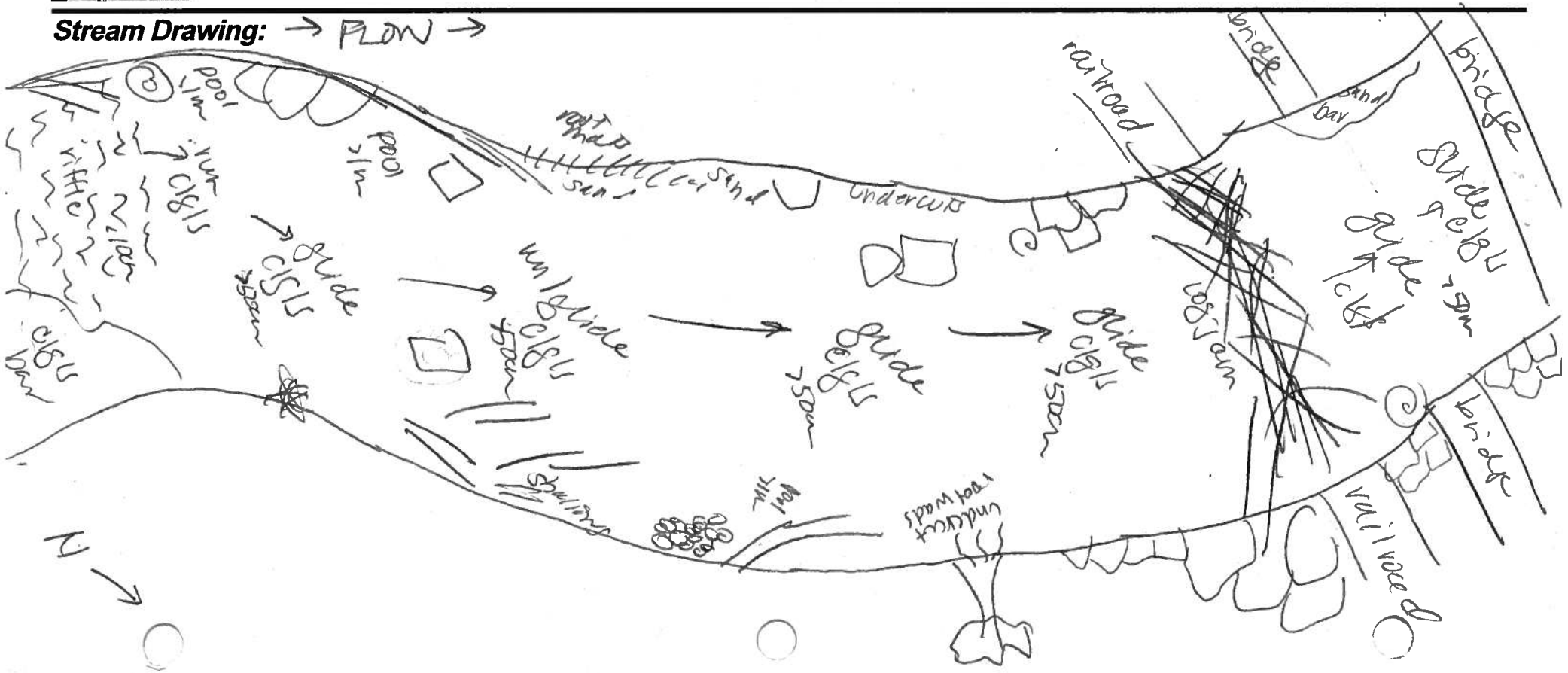
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 71.5

Stream & Location: Cuyahoga River US of Southerly WWTC **RM:** 10.75 **Date:** 09/09/15

Scorers Full Name & Affiliation: Francisco Rivera (Mario Meany) Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 41.4196 81.6547 Office verified location ☐

1] SUBSTRATE

Check *ONLY* Two substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE
☐ ☐ BLDR/SLABS [10]		
☐ ☐ BOULDER [9]	X	
☐ ☐ COBBLE [8]	X	Y
■ ☐ GRAVEL [7]	X	Y
☐ ■ SAND [6]	X	Y
☐ ☐ BEDROCK [5]		

OTHER TYPES	POOL	RIFFLE
☐ ☐ HARDPAN [4]		
☐ ☐ DETRITUS [3]		
☐ ☐ MUCK [2]		
☐ ☐ SILT [2]	X	X
☐ ☐ ARTIFICIAL [0]	X	X

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ■ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ■ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

EMBEDDEDNESS

SILT

QUALITY
- ☐ HEAVY [-2]
- ☐ MODERATE [-1]
- ■ NORMAL [0]
- ☐ FREE [1]
- ☐ EXTENSIVE [-2]
- ■ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ NONE [1]

Substrate 15 Maximum 20

Comments

2] INSTREAM COVER

Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

1 UNDERCUT BANKS [1]	1 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]
1 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]
1 SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	2 LOGS OR WOODY DEBRIS [1]
1 ROOTMATS [1]		

AMOUNT

Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ■ MODERATE 25-75% [7]
- ■ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

Cover Maximum 20: 14

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ☐ MODERATE [3]
- ■ LOW [2]
- ☐ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ■ GOOD [5]
- ■ FAIR [3]
- ☐ POOR [1]

CHANNELIZATION
- ■ NONE [6]
- ☐ RECOVERED [4]
- ☐ RECOVERING [3]
- ☐ RECENT OR NO RECOVERY [1]

STABILITY
- ☐ HIGH [3]
- ■ MODERATE [2]
- ■ LOW [1]

Comments

Channel Maximum 20: 13.5

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for *EACH BANK* (*Or 2 per bank & average*)

River right looking downstream

EROSION

L	R	
☐	☐	NONE / LITTLE [3]
■	■	MODERATE [2]
☐	■	HEAVY / SEVERE [1]

RIPARIAN WIDTH

L	R	
☐	☐	WIDE > 50m [4]
☐	☐	MODERATE 10-50m [3]
☐	☐	NARROW 5-10m [2]
■	■	VERY NARROW < 5m [1]
■	■	NONE [0]

FLOOD PLAIN QUALITY

L	R	
☐	☐	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☐	■	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

L	R	
☐	☐	CONSERVATION TILLAGE [1]
■	■	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian Maximum 10: 2.5

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check ONE (*ONLY!*)
- ■ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH

Check ONE (*Or 2 & average*)
- ■ POOL WIDTH > RIFFLE WIDTH [2]
- ■ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ■ FAST [1]
- ■ MODERATE [1]
- ■ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ■ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current Maximum 12: 11

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: ☐ NO RIFFLE [metric=0]

Check ONE (*Or 2 & average*).

RIFFLE DEPTH
- ■ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ■ MAXIMUM > 50cm [2]
- ☐ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ■ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ■ LOW [1]
- ■ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run Maximum 8: 5.5

6] GRADIENT

(1.75 ft/mi) DRAINAGE AREA (1743 mi²)

- ☐ VERY LOW - LOW [2-4]
- ■ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: %GLIDE: %RUN: %RIFFLE:

Gradient Maximum 10: 10

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

CLARITY

1st –sample pass–	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

1st_____ cm

2nd_____ cm

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

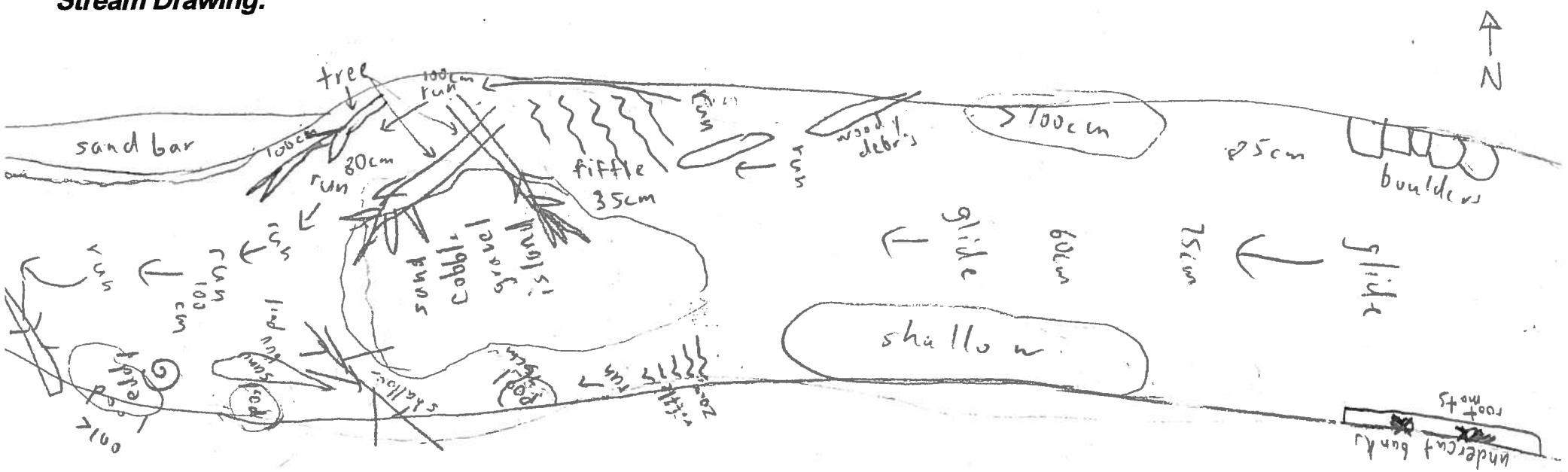
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 69.5

Stream & Location: Cuyahoga River Downstream of Satterly WWTC **RM:** 10.12 **Date:** 09/09/15

Scorers Full Name & Affiliation: Seth Hothem, Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 41.4242 / 81.6638 Office verified location ☐

1] SUBSTRATE
Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]	X		☐☐ HARDPAN [4]		
☐☐ BOULDER [9]	X	✓	☐☐ DETRITUS [3]		
☐☐ COBBLE [8]	X	X	☐☐ MUCK [2]		
■☐ GRAVEL [7]	X	X	☐☐ SILT [2]	X	X
☐■ SAND [6]	~	~	☐☐ ARTIFICIAL [0]	X	X
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ■ 4 or more [2] ☐ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN
- ☐ LIMESTONE [1]
- ■ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY
- SILT
  - ☐ HEAVY [-2]
  - ■ MODERATE [-1]
  - ☐ NORMAL [0]
  - ☐ FREE [1]
- EMBEDDEDNESS
  - ☐ EXTENSIVE [-2]
  - ■ MODERATE [-1]
  - ☐ NORMAL [0]
  - ☐ NONE [1]

Comments

Substrate 14 (Maximum 20)

2] INSTREAM COVER
Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

0 UNDERCUT BANKS [1]	2 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]
0 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]
1 SHALLOWS (IN SLOW WATER) [1]	2 BOULDERS [1]	2 LOGS OR WOODY DEBRIS [1]
1 ROOTMATS [1]		

AMOUNT Check ONE (Or 2 & average)
- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ■ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

Cover 10 (Maximum 20)

3] CHANNEL MORPHOLOGY
Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	■ NONE [6]	■ HIGH [3]
☐ MODERATE [3]	■ GOOD [5]	☐ RECOVERED [4]	■ MODERATE [2]
■ LOW [2]	☐ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel 15.5 (Maximum 20)

4] BANK EROSION AND RIPARIAN ZONE
Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L / R)	RIPARIAN WIDTH (L / R)	FLOOD PLAIN QUALITY (L / R)
■ ■ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	☐ ☐ FOREST, SWAMP [3]
■ ■ MODERATE [2]	☐ ☐ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]
☐ ☐ HEAVY / SEVERE [1]	■ ■ NARROW 5-10m [2]	☐ ■ RESIDENTIAL, PARK, NEW FIELD [1]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]
	☐ ☐ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]

L	R	
☐	☐	CONSERVATION TILLAGE [1]
☐	☐	URBAN OR INDUSTRIAL [0]
■	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 5 (Maximum 10)

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (ONLY!)
- ■ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (Or 2 & average)
- ■ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply

☐ TORRENTIAL [-1]	■ SLOW [1]
☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
■ FAST [1]	☐ INTERMITTENT [-2]
■ MODERATE [1]	■ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 12 (Maximum 12)

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
■ BEST AREAS > 10cm [2]	■ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	■ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	■ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run 5 (Maximum 8)

6] GRADIENT (0.90 ft/mi)
DRAINAGE AREA (744 mi²)

☐ VERY LOW - LOW [2-4]
■ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: ____ %GLIDE: ____
%RUN: ____ %RIFFLE: ____

Gradient 8 (Maximum 10)

A] SAMPLED REACH
Check ALL that apply

METHOD
- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE
- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY
- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

1st pass _____ cm
2nd _____ cm

C] RECREATION
AREA DEPTH
POOL: ☐ >100ft² ☐ >3ft

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS
- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

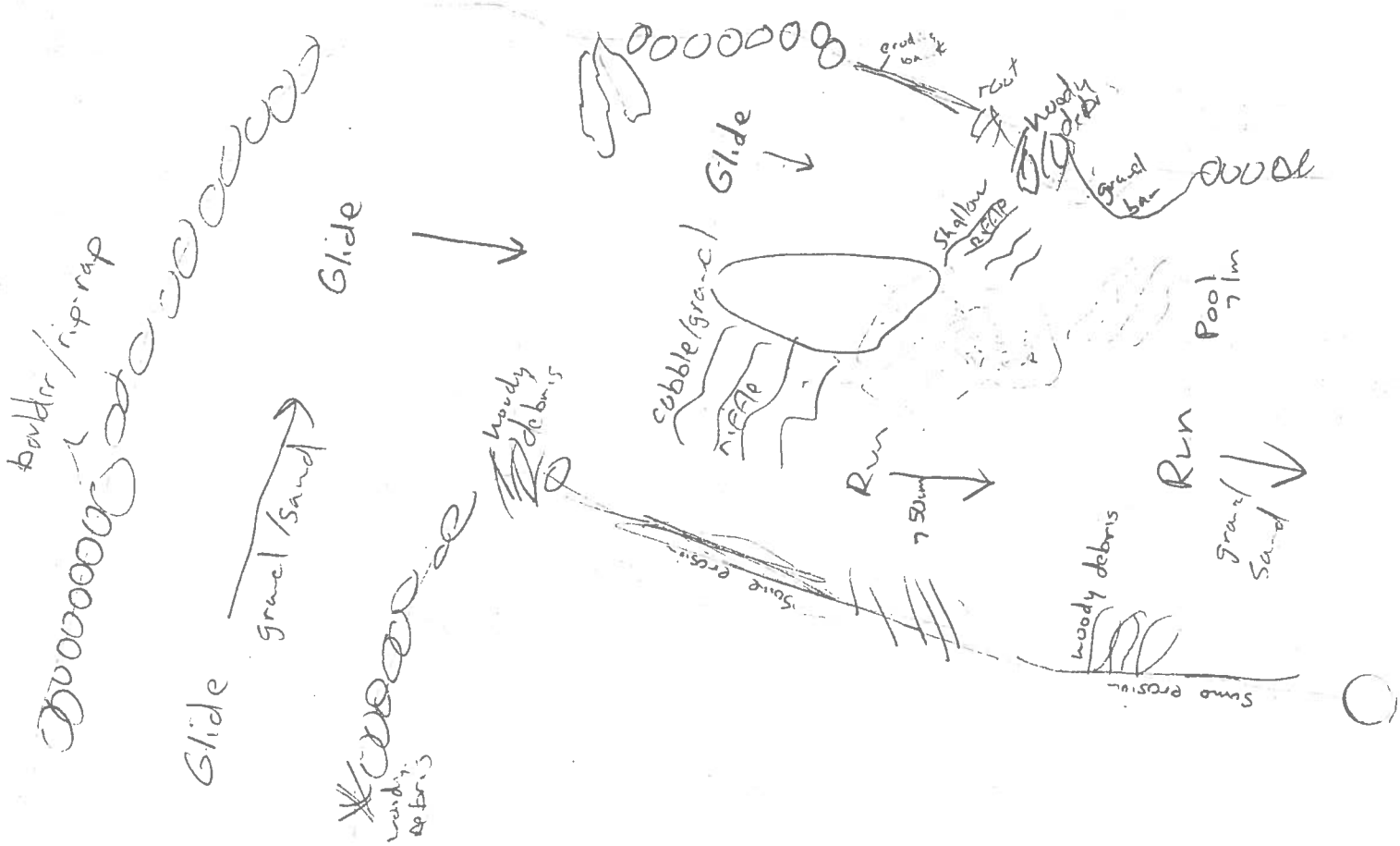
D] MAINTENANCE
Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS
- x̄ width
- x̄ depth
- max. depth
- x̄ bankfull width
- bankfull x̄ depth
- W/D ratio
- bankfull max. depth
- floodprone x² width
- entrench. ratio
- *Legacy Tree:*

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 71

Stream & Location: Cuyahoga River US of Big Creek **RM:** 8.60 **Date:** 09/10/15

Scorers Full Name & Affiliation: Donna Friedman, Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 41.4381 / 81.6680 ☐ Office verified location

1] SUBSTRATE
Check *ONLY* Two substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR/SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]		X	☐☐ DETRITUS [3]		
☐☐ COBBLE [8]	X	X	☐☐ MUCK [2]		
☐■ GRAVEL [7]	X	X	☐☐ SILT [2]		
■☐ SAND [6]	X	X	☐☐ ARTIFICIAL [0]	X	X
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ■ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ■ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☐ MODERATE [-1]
- ■ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ☐ MODERATE [-1]
- ■ NORMAL [0]
- ☐ NONE [1]

Comments

Substrate 16 *Maximum 20*

2] INSTREAM COVER
Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

2 UNDERCUT BANKS [1]	3 POOLS > 70cm [2]	___ OXBOWS, BACKWATERS [1]
1 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	___ AQUATIC MACROPHYTES [1]
3 SHALLOWS (IN SLOW WATER) [1]	___ BOULDERS [1]	3 LOGS OR WOODY DEBRIS [1]
2 ROOTMATS [1]		

AMOUNT
Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ■ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

8

Cover *Maximum 20* 15

3] CHANNEL MORPHOLOGY
Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ■ MODERATE [3]
- ☐ LOW [2]
- ☐ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ■ GOOD [5]
- ☐ FAIR [3]
- ☐ POOR [1]

CHANNELIZATION
- ■ NONE [6]
- ☐ RECOVERED [4]
- ☐ RECOVERING [3]
- ☐ RECENT OR NO RECOVERY [1]

STABILITY
- ☐ HIGH [3]
- ■ MODERATE [2]
- ☐ LOW [1]

Comments

Channel *Maximum 20* 16

4] BANK EROSION AND RIPARIAN ZONE
Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION

L	R	
■	■	NONE / LITTLE [3]
■	■	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

RIPARIAN WIDTH

L	R	
■	■	WIDE > 50m [4]
■	■	MODERATE 10-50m [3]
☐	☐	NARROW 5-10m [2]
☐	☐	VERY NARROW < 5m [1]
☐	☐	NONE [0]

FLOOD PLAIN QUALITY

L	R	
☐	☐	FOREST, SWAMP [3]
☐	■	SHRUB OR OLD FIELD [2]
■	☐	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]
☐	☐	CONSERVATION TILLAGE [1]
☐	■	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian

Comments

Riparian *Maximum 10* 7

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH
Check **ONE** (*ONLY!*)
- ■ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH
Check ONE (*Or 2 & average*)
- ■ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY
Check ALL that apply
- ☐ TORRENTIAL [-1]
- ■ SLOW [1]
- ■ VERY FAST [1]
- ☐ INTERSTITIAL [-1]
- ■ FAST [1]
- ☐ INTERMITTENT [-2]
- ■ MODERATE [1]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current *Maximum 12* 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ■ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ■ MAXIMUM > 50cm [2]
- ☐ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ☐ MOD. STABLE (e.g., Large Gravel) [1]
- ■ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ■ LOW [1]
- ☐ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run *Maximum 8* 5

6] GRADIENT
(2.03 ft/mi)

DRAINAGE AREA
(745 mi²)

- ☐ VERY LOW - LOW [2-4]
- ■ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: ___ %GLIDE: ___ %RUN: ___ %RIFFLE: ___

Gradient *Maximum 10* 10

A] SAMP( )REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

STAGE

1st -sample pass-		2nd
☐	HIGH	☐
☐	UP	☐
☐	NORMAL	☐
☐	LOW	☐
☐	DRY	☐

CLARITY

1st --sample pass--		2nd
☐	< 20 cm	☐
☐	20-<40 cm	☐
☐	40-70 cm	☐
☐	> 70 cm/ CTB	☐
☐	SECCHI DEPTH	☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

1st pass _____ cm

2nd _____ cm

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

Comment RE: Reach consistency/ Is reach typical of steam? *F( )ation/* Observed - Inferred. *Other/* Sampling observations. Concerns. Access direc( ) etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

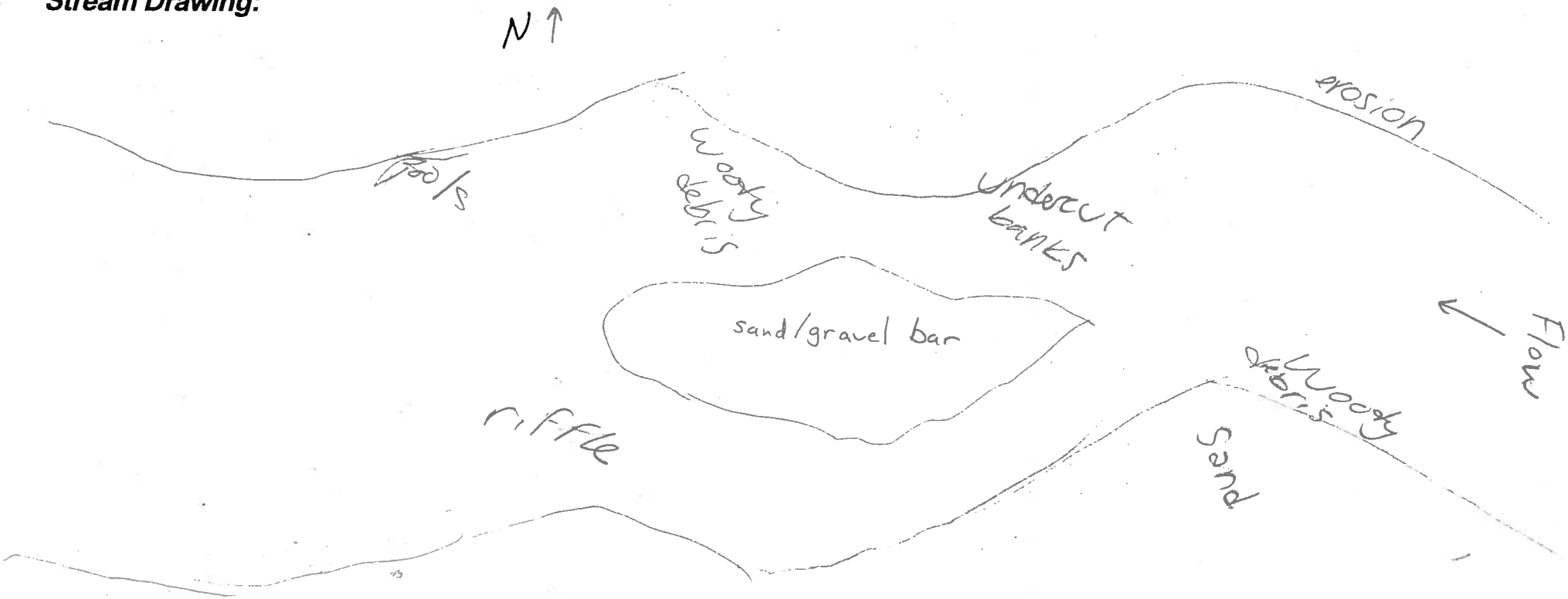
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 70.5

Stream & Location: Cuyahoga River Lower Harvard Bridge **RM:** 7.00 **Date:** 08/06/15

Donna Friedman **Scorers Full Name & Affiliation:** Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 41.44971 81.6815 **Office verified location** ☐

1] SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR/SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]	X		☐☐ DETRITUS [3]		
☐■ COBBLE [8]	X		☐☐ MUCK [2]	X	
■☐ GRAVEL [7]	X		☐☐ SILT [2]		
☐☐ SAND [6]	X		☐☐ ARTIFICIAL [0]	X	
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ■ 4 or more [2] ☐ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN
- ☐ LIMESTONE [1]
- ■ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☐ MODERATE [-1]
- ■ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ☐ MODERATE [-1]
- ■ NORMAL [0]
- ☐ NONE [1]

Comments 8+7+2 | 1 | 0

Substrate 18 Maximum 20

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

- 1 UNDERCUT BANKS [1]
- 2 OVERHANGING VEGETATION [1]
- 1 SHALLOWS (IN SLOW WATER) [1]
- ___ ROOTMATS [1]
- 2 POOLS > 70cm [2]
- ___ ROOTWADS [1]
- 1 BOULDERS [1]
- ___ OXBOWS, BACKWATERS [1]
- 1 AQUATIC MACROPHYTES [1]
- 2 LOGS OR WOODY DEBRIS [1]

AMOUNT

Check ONE (Or 2 & average)
- ☐ EXTENSIVE >75% [11]
- ■ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments 8+7

Cover Maximum 20: 15

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY
- ☐ HIGH [4]
- ■ MODERATE [3]
- ☐ LOW [2]
- ☐ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☐ GOOD [5]
- ■ FAIR [3]
- ☐ POOR [1]

CHANNELIZATION
- ■ NONE [6]
- ☐ RECOVERED [4]
- ☐ RECOVERING [3]
- ☐ RECENT OR NO RECOVERY [1]

STABILITY
- ■ HIGH [3]
- ■ MODERATE [2]
- ☐ LOW [1]

Comments no riffle anymore 6+2.5+6

Channel Maximum 20: 14.5

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION

L	R	
■	■	NONE / LITTLE [3]
☐	☐	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

RIPARIAN WIDTH

L	R	
☐	☐	WIDE > 50m [4]
☐	■	MODERATE 10-50m [3]
☐	☐	NARROW 5-10m [2]
■	☐	VERY NARROW < 5m [1]
☐	☐	NONE [0]

FLOOD PLAIN QUALITY

L	R	
☐	☐	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☐	☐	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

L	R	
☐	☐	CONSERVATION TILLAGE [1]
■	■	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian

Comments 3+2+0

Riparian Maximum 10: 5

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check ONE (ONLY!)
- ■ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH

Check ONE (Or 2 & average)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ■ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☐ FAST [1]
- ☐ MODERATE [1]
- ■ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments no riffle 6+1+1

Pool / Current Maximum 12: 8

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ■ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☐ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ☐ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☐ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run Maximum 8: 0

6] GRADIENT (2.03 ft/mi)

DRAINAGE AREA (1786 mi²)
- ☐ VERY LOW - LOW [2-4]
- ■ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: ___ %GLIDE: ___

%RUN: ___ %RIFFLE: ___

Gradient Maximum 10: 10

A] SAMPLE REACH

Check All that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

1st pass _____ cm

2nd _____ cm

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

Comment RE: Reach consistency/ Is reach typical of steam?, *Rec[illegible]tion/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directio[illegible]tc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

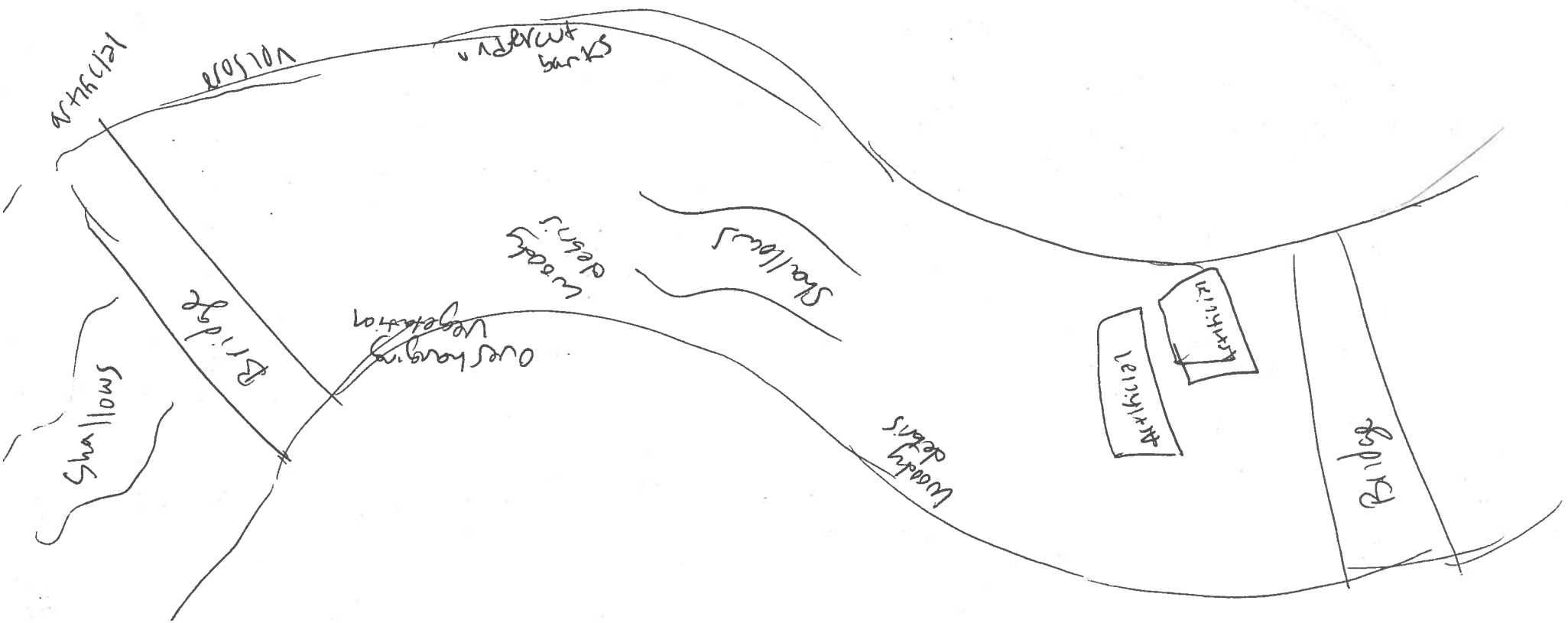
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 90.75 (5.90)

Stream & Location: Cuyahoga River; Upstream of Newburgh Southbound **RM:** 5.90 **Date:** 08/06/15

Friedman (Zablotny) **Scorers Full Name & Affiliation:** Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 41.4642 181.6788 **Office verified location** ☐

1] SUBSTRATE
Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR/SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]			☐☐ DETRITUS [3]		
☐☐ COBBLE [8]			☒☒ MUCK [2]	✓	
☐☐ GRAVEL [7]			☐☐ SILT [2]	✓	
☐☐ SAND [6]			☐☐ ARTIFICIAL [0]	✓	
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ■ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN
- ☐ LIMESTONE [1]
- ■ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

EMBEDDEDNESS

SILT
- ■ HEAVY [-2]
- ☐ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ FREE [1]

QUALITY
- ☐ EXTENSIVE [-2]
- ■ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ NONE [1]

Substrate 2 / Maximum 20

Comments

2] INSTREAM COVER
Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

2 UNDERCUT BANKS [1]	1 POOLS > 70cm [2]	__ OXBOWS, BACKWATERS [1]	
2 OVERHANGING VEGETATION [1]	__ ROOTWADS [1]	1 AQUATIC MACROPHYTES [1]	
2 SHALLOWS (IN SLOW WATER) [1]	__ BOULDERS [1]	3 LOGS OR WOODY DEBRIS [1]	
__ ROOTMATS [1]			

AMOUNT Check ONE (Or 2 & average)
- ☐ EXTENSIVE >75% [11]
- ■ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments 6+7

Cover 13 / Maximum 20

3] CHANNEL MORPHOLOGY
Check ONE in each category (Or 2 & average)

SINUOSITY
- ☐ HIGH [4]
- ☐ MODERATE [3]
- ☒ LOW [2]
- ■ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☐ GOOD [5]
- ■ FAIR [3]
- ☐ POOR [1]

CHANNELIZATION
- ☐ NONE [6]
- ☐ RECOVERED [4]
- ☐ RECOVERING [3]
- ■ RECENT OR NO RECOVERY [1]

STABILITY
- ■ HIGH [3]
- ☐ MODERATE [2]
- ☐ LOW [1]

Comments

Channel 8 / Maximum 20

4] BANK EROSION AND RIPARIAN ZONE
Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)
- ■■ NONE / LITTLE [3]
- ☐☐ MODERATE [2]
- ☐☐ HEAVY / SEVERE [1]

RIPARIAN WIDTH (L R)
- ☐☐ WIDE > 50m [4]
- ☐☐ MODERATE 10-50m [3]
- ☐■ NARROW 5-10m [2]
- ☐■ VERY NARROW < 5m [1]
- ■☐ NONE [0]

FLOOD PLAIN QUALITY (L R)
- ☐☐ FOREST, SWAMP [3]
- ☐☐ SHRUB OR OLD FIELD [2]
- ☐☐ RESIDENTIAL, PARK, NEW FIELD [1]
- ☐☐ FENCED PASTURE [1]
- ☐☐ OPEN PASTURE, ROWCROP [0]

LAND USE (L R)
- ☐☐ CONSERVATION TILLAGE [1]
- ■■ URBAN OR INDUSTRIAL [0]
- ☐☐ MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian

Comments 3 + 0.75 + 0

Riparian 3.75 / Maximum 10

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (ONLY!)
- ■ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (Or 2 & average)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ■ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☐ FAST [1]
- ☐ MODERATE [1]
- ■ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments 6 + 1 + 1

Pool / Current 8 / Maximum 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☒ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☐ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ☐ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☐ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run 0 / Maximum 8

6] GRADIENT (0.10 ft/mi)
DRAINAGE AREA (1787 mi²)
- ☐ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: ___ %GLIDE: 100
%RUN: ___ %RIFFLE: ___

Gradient 6 / Maximum 10

RM 5.90

A] SAMPLE REACH

Check ALL that apply

Comment RE: Reach consistency/ Is reach typical of steam?, *Re[illegible]tion/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directi[illegible]etc.

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

1st pass _____ cm

2nd _____ cm

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

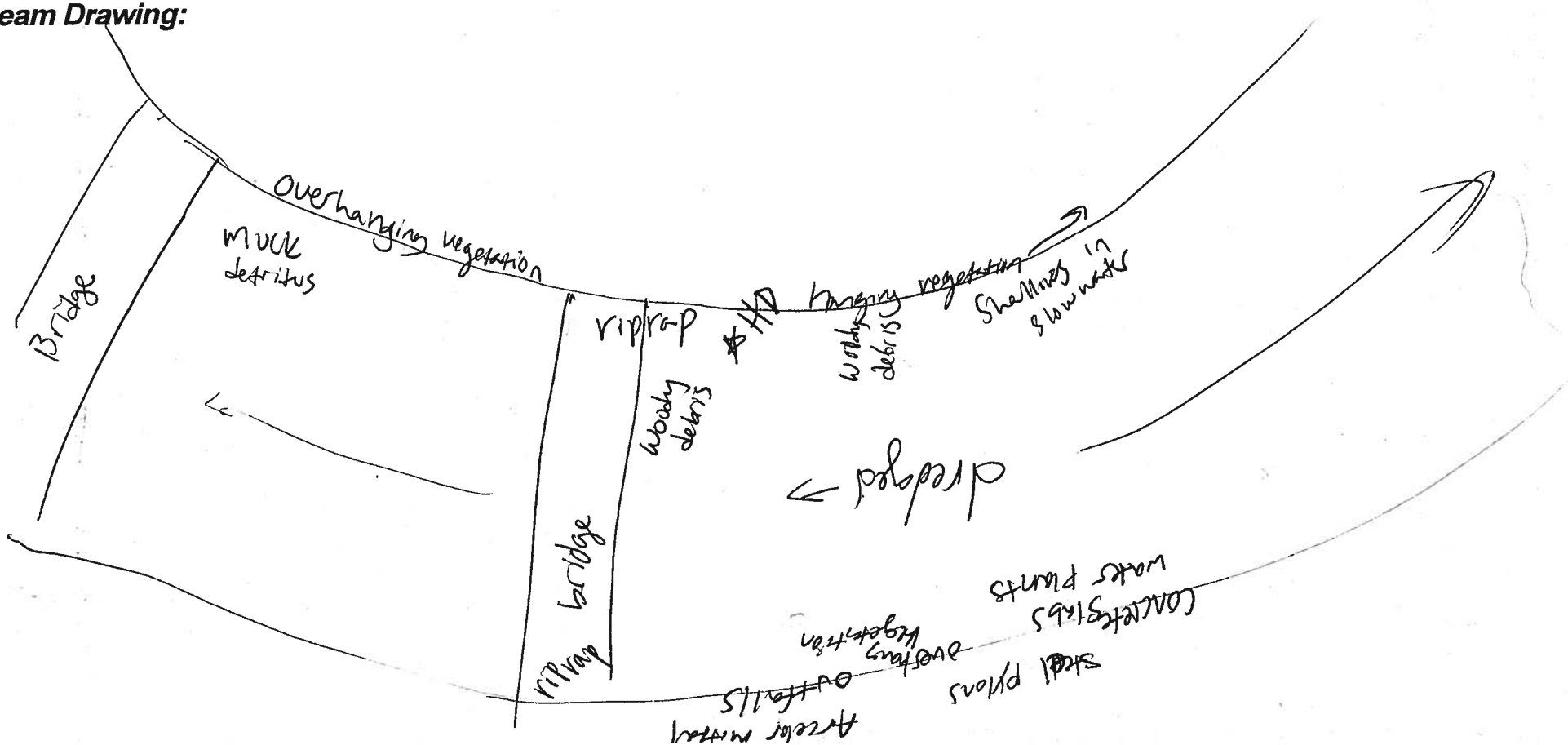
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 33

Stream & Location: Cuyahoga River Scarvell Marina **RM:** 2.75 **Date:** 97/3/15

Eric Soechnlen **Scorers Full Name & Affiliation:** Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 41.4981 / 81.6938 **Office verified location** ☐

1] SUBSTRATE
Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR/SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]	✓		☐☐ DETRITUS [3]		
☐☐ COBBLE [8]			■■ MUCK [2]	✓	
☐☐ GRAVEL [7]			☐☐ SILT [2]	✓	
☐☐ SAND [6]			☐☐ ARTIFICIAL [0]	✓	
☐☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ■ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN	QUALITY	
☐ LIMESTONE [1]	■ HEAVY [-2]	
■ TILLS [1]	☐ MODERATE [-1]	SILT
☐ WETLANDS [0]	☐ NORMAL [0]	
☐ HARDPAN [0]	☐ FREE [1]	
☐ SANDSTONE [0]	■ EXTENSIVE [-2]	EMBEDDEDNESS
☐ RIP/RAP [0]	☐ MODERATE [-1]	
☐ LACUSTURINE [0]	☐ NORMAL [0]	
☐ SHALE [-1]	☐ NONE [1]	
☐ COAL FINES [-2]		

Substrate 1 (Maximum 20)

Comments

2] INSTREAM COVER
Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

0	UNDERCUT BANKS [1]	2	POOLS > 70cm [2]	0	OXBOWS, BACKWATERS [1]	1	BOULDERS [1]
0	OVERHANGING VEGETATION [1]	0	ROOTWADS [1]	0	AQUATIC MACROPHYTES [1]	1	LOGS OR WOODY DEBRIS [1]
1	SHALLOWS (IN SLOW WATER) [1]						
0	ROOTMATS [1]						

AMOUNT Check ONE (Or 2 & average)
☐ EXTENSIVE >75% [11]
☐ MODERATE 25-75% [7]
■ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments 1 3 1 3

Cover 8 (Maximum 20) 9

3] CHANNEL MORPHOLOGY
Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	■ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☐ MODERATE [2]
☐ LOW [2]	☐ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
■ NONE [1]	■ POOR [1]	■ RECENT OR NO RECOVERY [1]	

Comments 1 1 1 3

Channel 6 (Maximum 20) 15

4] BANK EROSION AND RIPARIAN ZONE
Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L / R)	RIPARIAN WIDTH (L / R)	FLOOD PLAIN QUALITY (L / R)	(L / R)
■■ NONE / LITTLE [3]	☐☐ WIDE > 50m [4]	☐☐ FOREST, SWAMP [3]	☐☐ CONSERVATION TILLAGE [1]
☐☐ MODERATE [2]	☐☐ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]	■■ URBAN OR INDUSTRIAL [0]
☐☐ HEAVY / SEVERE [1]	■☐ NARROW 5-10m [2]	☐☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐☐ MINING / CONSTRUCTION [0]
	☐☐ VERY NARROW < 5m [1]	☐☐ FENCED PASTURE [1]	
	☐■ NONE [0]	☐☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments 3 1 6

Riparian 4 (Maximum 10) 19

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (ONLY!)
■ > 1m [6]
☐ 0.7-<1m [4]
☐ 0.4-<0.7m [2]
☐ 0.2-<0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (Or 2 & average)
☐ POOL WIDTH > RIFFLE WIDTH [2]
■ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply

☐ TORRENTIAL [-1]	■ SLOW [1]
☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
☐ FAST [1]	☐ INTERMITTENT [-2]
☐ MODERATE [1]	☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments 6 1 1

Pool / Current 8 (Maximum 12) 27

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ■ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☐ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run 0 (Maximum 8) 27

6] GRADIENT (0.10 ft/mi)
DRAINAGE AREA (1806 mi²)

■ VERY LOW - LOW [2-4]
☐ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: %GLIDE: %RUN: %RIFFLE:

Gradient 6 (Maximum 10) 33

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

CLARITY

1st –sample pass–	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

1st pass _____ cm

2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

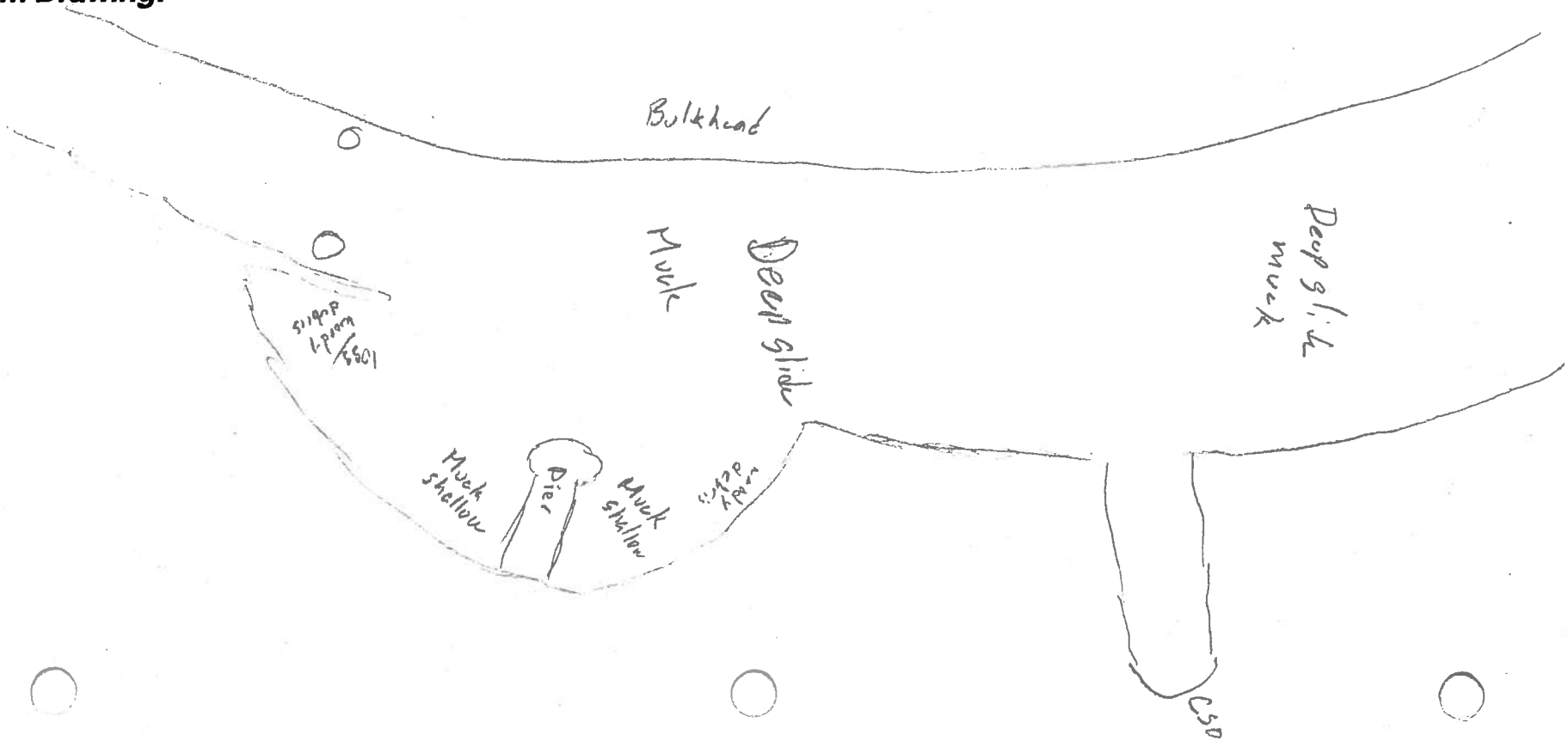
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 28.75

Stream & Location: CUYAHOGA RIVER - NEAR MOUTH / CONFLUENCE W/ LAKE ERIE **RM:** 0.20 **Date:** 8/25/15

Scorers Full Name & Affiliation: ZAMBORSKY, (ZABLOTNY) Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 41.5008 / 81.7098 **Office verified location** ☐

1] SUBSTRATE
Check *ONLY* Two substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]			☐☐ HARDPAN [4]	✓	
☐☐ BOULDER [9]			☐☐ DETRITUS [3]		
☐☐ COBBLE [8]			■■ MUCK [2]	✓	
☐☐ GRAVEL [7]	✓		☐☐ SILT [2]	✓	
☐☐ SAND [6]	✓		☐☐ ARTIFICIAL [0]		
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ■ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ■ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ■ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ■ EXTENSIVE [-2]
- ■ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ NONE [1]

Substrate 4.5 / Maximum 20

Comments RIVER DEPTH >20' ↳ SINCE PRIMARILY MUCK

2] INSTREAM COVER
Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

- 0 UNDERCUT BANKS [1]
- 0 OVERHANGING VEGETATION [1]
- 0 SHALLOWS (IN SLOW WATER) [1]
- 0 ROOTMATS [1]
- 0 POOLS > 70cm [2]
- 0 ROOTWADS [1]
- 0 BOULDERS [1]
- 0 OXBOWS, BACKWATERS [1]
- 0 AQUATIC MACROPHYTES [1]
- 0 LOGS OR WOODY DEBRIS [1]

AMOUNT Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ■ NEARLY ABSENT <5% [1]

Cover Maximum 20: 1

Comments DREDGED; CHANNELIZED, >20' IN DEPTH - NO COVER

3] CHANNEL MORPHOLOGY
Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	■ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☐ MODERATE [2]
☐ LOW [2]	☐ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
■ NONE [1]	■ POOR [1]	■ RECENT OR NO RECOVERY [1]	

Channel Maximum 20: 6

Comments ROUTINELY DREDGED

4] BANK EROSION AND RIPARIAN ZONE
Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION (L / R)	RIPARIAN WIDTH (L / R)	FLOOD PLAIN QUALITY (L / R)
■ ■ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	☐ ☐ FOREST, SWAMP [3]
☐ ☐ MODERATE [2]	☐ ☐ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]
☐ ☐ HEAVY / SEVERE [1]	☐ ☐ NARROW 5-10m [2]	■ ☐ RESIDENTIAL, PARK, NEW FIELD [1]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]
	■ ■ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]
		☐ ☐ CONSERVATION TILLAGE [1]
		■ ■ URBAN OR INDUSTRIAL [0]
		☐ ☐ MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Riparian Maximum 10: 3.25

Comments 3 0.25

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check **ONE** (*ONLY!*)
- ■ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (*Or 2 & average*)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ✓ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☐ FAST [1]
- ☐ MODERATE [1]
- ■ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Pool / Current Maximum 12: 8

Comments NO DEFINED POOL AREA

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☐ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ☐ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☐ MODERATE [0]
- ☐ EXTENSIVE [-1]

Riffle / Run Maximum 8: 0

Comments NO RIFFLE

6] GRADIENT (10 ft/mi)
DRAINAGE AREA (0.13 mi²)
- ☐ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: ____ %GLIDE: ____
%RUN: ____ %RIFFLE: ____

Gradient Maximum 10: 6

A] SAMPL[illegible]REACH

Check ALL that apply

Comment RE: Reach consistency/ Is reach typical of steam?. *Re[illegible]tion/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directio[illegible]etc.

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

1st pass _____ cm

2nd _____ cm

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

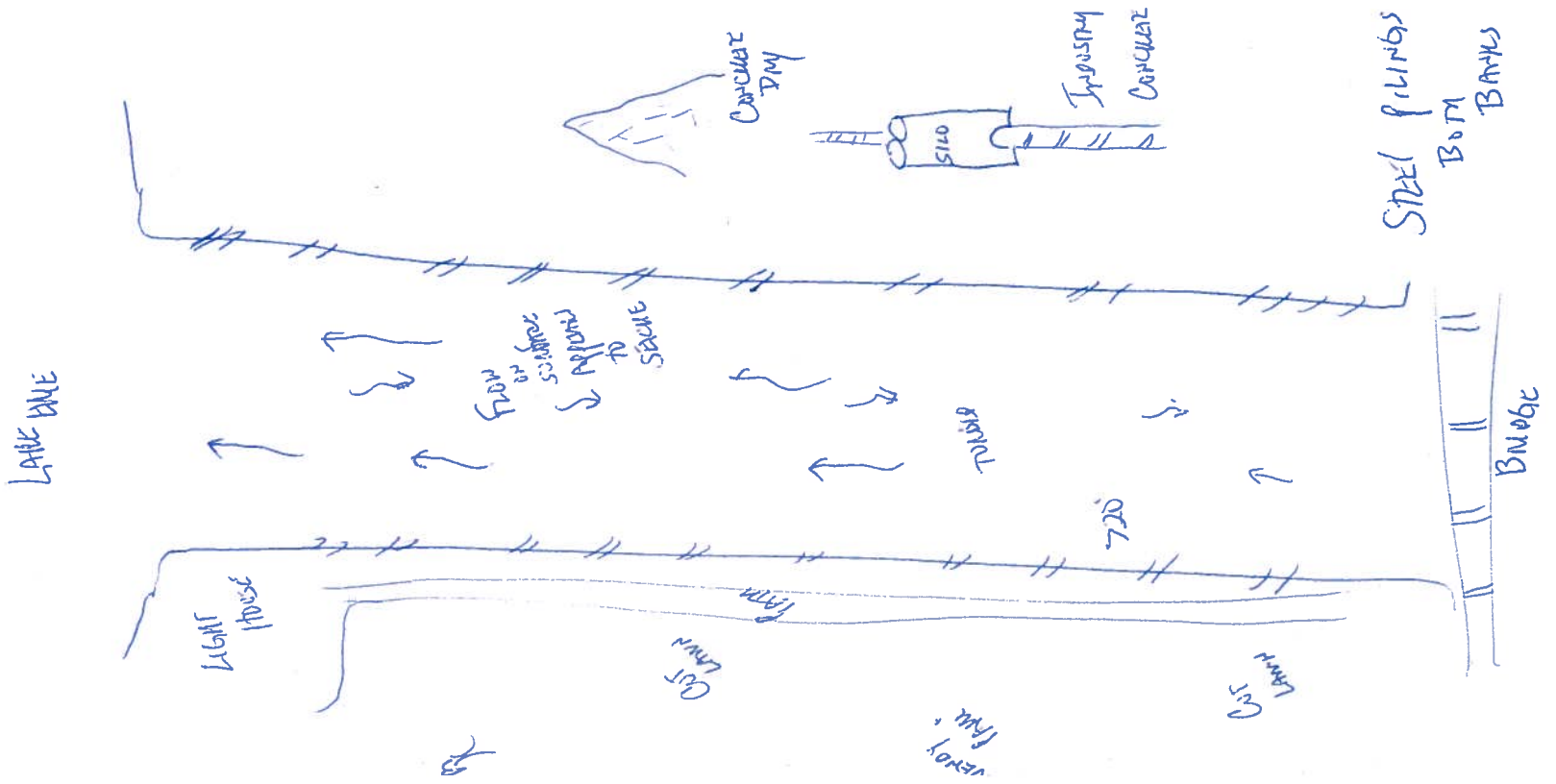
E] ISSUES

WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio
- *Legacy Tree:*

Stream Drawing:



Lake / Lacustuary (Lentic) QHEI Field Sheet

Environmental Protection Agency QHEI Score: 27

RIVERCODE ____ RIVERMILE 5.90 WATERBODY Cuyahoga R. DISTANCE ASSESSED (m): .50 km,
DATE 8-6-15 LOCATION U.S Newburg SS RR Bridge
SCORER Zablotny LAT. 41.4642 LONG. -81.6788 COMMENT ship channel
Newburgss RR

LAKE: ____ LACUSTUARY: ✓

1] SUBSTRATE (Check *ONLY* Two Substrate TYPE BOXES; Estimate % or note every type present);

TYPE	SHORE	BOTTOM		SHORE	BOTTOM
☐☐-BLDR/SLABS [7]			☐☐-HARDPAN [4]		
☐☐-BOULDER [10]			☐☐-BEDROCK [3]		
☐☐-COBBLE [8]			☐☐-DETRITUS [3]		
☐☐-GRAVEL [7]			☐☐-SILT [2]	✓	
☐☐-SAND [6]			☐☐-MUCK [2]	✓	

NOTE: Ignore sludge that onginates from point-sources, score on natural substrates
NUMBER OF SUBSTRATE TYPES ☐-5 or More [2] ☐-4 or Less [0]

SUBSTRATE ORIGIN Check ONE (or 2 & *AVERAGE*)
☐-LIMESTONE [1] ☐-TILLS [1] ☐-WETLANDS [1] ☐-LACUSTUARINE [1] ☐-SANDSTONE [1] ☐-RIP/RAP [1] ☐-HARDPAN [0] ☐-SHALE [-1] ☐-COAL/ORE [-2]

SILT ORIGIN: ☐-ORGANIC [1] ☐-INDUSTRIAL [-1] ☐-CLAY [-2] ☐-NONE [1]

SUBSTRATE QUALITY Check ONE (or 2 & *AVERAGE*)
☐-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]

Substrate 4 Max 20

COMMENTS ____

2] COVER TYPES

TYPE: (Check *All* That Apply)		
☐-OFF-SHORE SAND BARS [4]	☐-DEEPWATER > 1 M [1]	☐-WETLAND POOLS [1]
☐-OVERHANGING VEGETATION [1]	☐-ROOTWADS [1]	☐-SUBMERGED AQUATIC VEG. [4]
☐-SHALLOWS (ON BEACH) [1]	☐-BOULDERS [1]	☐-LOGS OR WOODY DEBRIS [1]
☐-ROOTMATS [1]	☐-SAND BEACH [1]	☐-GRAVEL BEACH [1]

AMOUNT (Check *ONLY* One or check2 and AVERAGE)
☐-EXTENSIVE > 75% [9] ☐-MODERATE 25-75% [7] ☐-SPARSE 5-25% [3] ☐-NEARLY ABSENT < 5% [1]

Cover 11 Max 20

COMMENTS ____

3] SHORELINE MORPHOLOGY (Check *ONLY* one PER category or check 2 and *AVERAGE*)

SHORE SINUOSITY
☐-HIGH [2] ☐-MODERATE [4] ☐-LOW [3] ☐-NONE [1]

DEVELOPMENT
☐-EXCELLENT [6] ☐-GOOD [5] ☐-FAIR [3] ☐-POOR [1]

MODIFICATION
☐-NONE [7] ☐-RECOVERED [5] ☐-RECOVERING [3] ☐-RECENT OR NO RECOVERY [1]

STABILITY
☐-HIGH [3] ☐-MODERATE [2] ☐-LOW [1]

SHORE to BOTTOM SLOPE MORPHOLOGIES
☐-SLOPE < 15 deg. [0] ☐-SLOPE > 45 deg. [2] ☐-SLOPE < 25 deg. [1] ☐-SLOPE 90 deg. [0] ☐-SLOPE > 25 deg. [3]

AVERAGE DEPTH (of 5 measures) 13-16'
☐-<50 cm [0] ☐->400-500 cm [4] ☐-50-<100 cm [1] ☐->500-900 cm [2] ☐-≥100-200 cm [2] ☐->900 cm [1] ☐->200-400 cm [3] 29.5'

MODIFICATIONS OF SAMPLED SHORELINE
☐-CEMENTED [-1] ☐-STEEL BULKHEADS [-2] ☐-RIP RAPPED [1] ☐-ISLANDS [1] ☐-RAILROAD TIES [-1] ☐-DIKES [-1] ☐-DREDGED [-1] ☐-BANK SHAPING [-1] ☐-TWO SIDE CHANNEL MODIFICATIONS [-1] ☐-WOOD PILINGS [1] ☐-SHIP CHANNEL [-2]

Shore Line 12 Max 20

COMMENTS ____

★ Shore Right Looking East or South on Lake ★
★ Shore Right Looking Toward Lake in Lacustuary ★

4] RIPARIAN ZONE AND BANK EROSION (Check *ONE* box PER bank or 2 and *AVERAGE*)

RIPARIAN WIDTH L R (Per Bank)
☐☐-WIDE > 50 m [4] ☐☐-MODERATE 10-50 m [3] ☐☐-NARROW 5-10 m [2] ☐☐-VERY NARROW < 5 m [1] ☐☐-NONE [0]

SHORE LINE QUALITY (PAST 100 FOOT RIPARIAN) L R (Most Predominant Per Bank)
☐☐-FOREST, WETLAND, LAKE [3] ☐☐-SHRUB OR OLD FIELD [2] ☐☐-VINEYARD, ORCHARD [2] ☐☐-FENCED PASTURE [1] ☐☐-RESIDENTIAL, PARK, NEW FIELD [1]
☐☐-CONSERVATION TILLIAGE [1] ☐☐-URBAN OR INDUSTRIAL [0] ☐☐-OPEN PASUTRE, ROW CROP [0] ☐☐-MINING/CONSTRUCTION [0] ☐☐-DIKED WETLAND [0]

BANK EROSION L R (Per Bank)
☐☐-NONE/LITTLE [3] ☐☐-MODERATE [-1] ☐☐-HEAVY/SEVERE [-3]

Riparian 0 Max 10

COMMENTS ____

5] AQUATIC VEGETATION QUALITY: PLANT SPECIES OBSERVED (Sum All Scores)
(Score all for observed abundance ABUNDANT = [3]; COMMON = [5]; FEW = [1]; UNCOMMON = [0])

X NO AQUATIC VEGETATION = 0

____-Pond Lilies (NYMPHAEA) ____-Sedge (CYPERACEAE) ____-Wild Celery (VALLISNERIA)
____-Pond Weed (POTAMOGETON) ____-Bulrush (SCIRPUS) ____-Waterweed (ELODEA) ____-Wild Rice (ZIZANIA)

(Score all for observed abundance ABUNDANT = [-2], COMMON = [-1], FEW = [0])

____-Purple Loosestrife ____-Reed Grass ____-Eurasian Milfoil ____-Cattails ____-Algae (mats) ____-Algae (planktonic)

Vegetation 0 Max 30

COMMENTS ____

Is the Sampling Reach Representative of Area Habitat? (Y/N)____ If Not, Explain: _____

Depth measures: | | | | | | |

Zebra Mussel/Quagga Mussel Coverage ☐-->60% ☐-60-->25% ☐-25-->10% ☐-<10-->1% ☐-1--0%

	Gear	Distance	Water Clarity	Wave Height
First Sampling Pass:	_____	_____	_____	_____
Second Sampling Pass:	_____	_____	_____	_____
Third Sampling Pass:	_____	_____	_____	_____

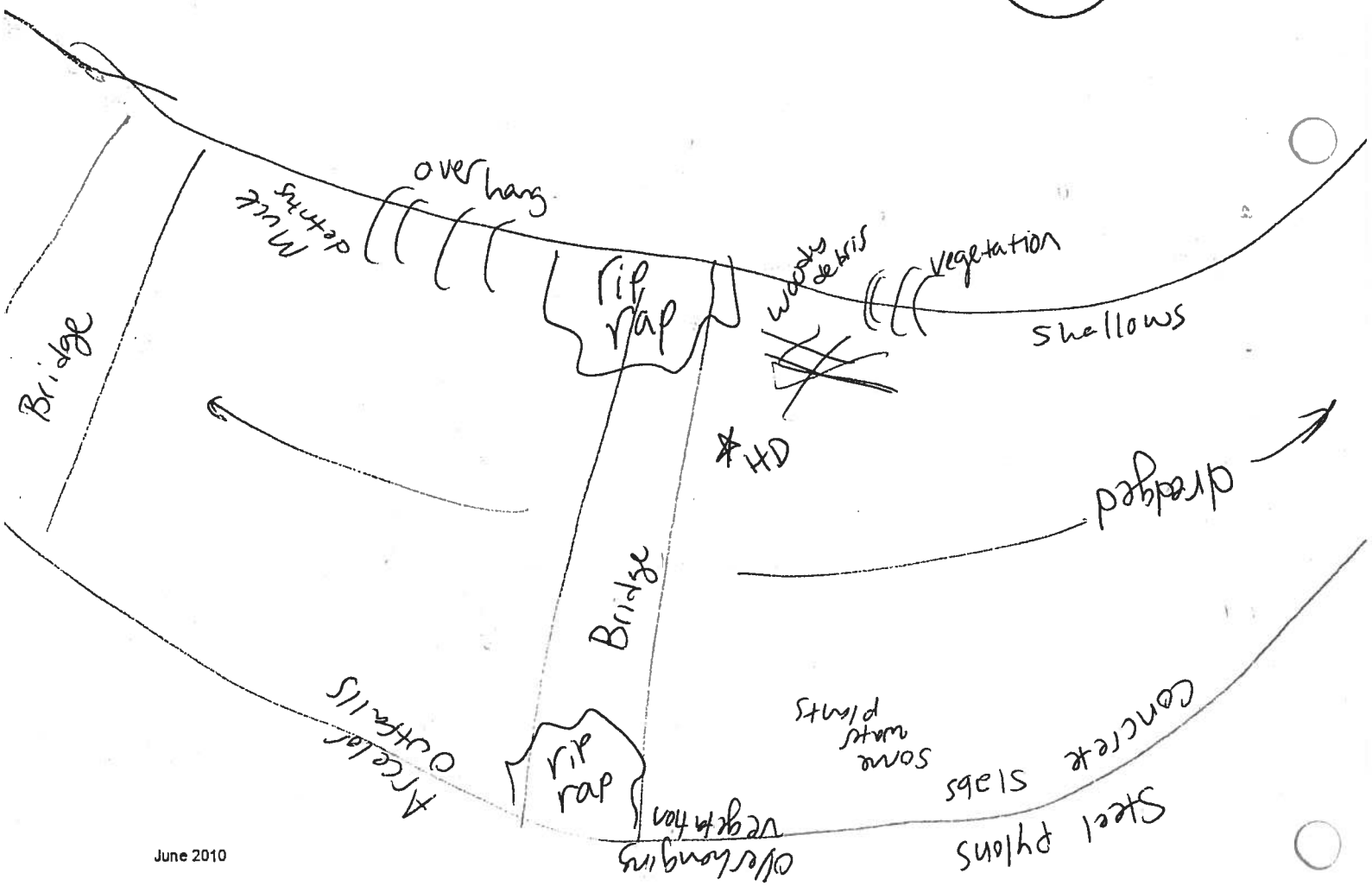
Subjective Rating (1-10) ☐ Aesthetic Rating (1-10) ☐

Photos: _____

WATERBODY MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ Maximum Depth: _____

DRAWING OF SITE:

North Arrow: ○



Lake / Lacustuary (Lentic) QHEI Field Sheet

Ohio Environmental Protection Agency

QHEI Score: 21

RIVERCODE _____ RIVERMILE 2.75 WATERBODY Cuyahoga R DISTANCE ASSESSED (m): 0.5 km
DATE 7-31-15 LOCATION Old Scarvelli's Marina
SCORER Zablotny LAT. 41.4881 LONG. 81.6938 COMMENT _____

1] SUBSTRATE (Check *ONLY* Two Substrate TYPE BOXES; Estimate % or note every type present); LAKE: ____ LACUSTUARY: X

TYPE	SHORE	BOTTOM		SHORE	BOTTOM
☐☐-BLDR/SLABS [7]			☐☐-HARDPAN [4]		
☐☐-BOULDER [10]			☐☐-BEDROCK [3]		
☐☐-COBBLE [8]			☐☐-DETRITUS [3]		
☐☐-GRAVEL [7]	✓	✓	☐☐-SILT [2]		
☐☐-SAND [6]			■■-MUCK [2]	✓	✓

SUBSTRATE ORIGIN Check ONE (or 2 & *AVERAGE*)
☐-LIMESTONE [1]
■-TILLS [1]
☐-WETLANDS [1]
☐-LACUSTUARINE [1]
☐-SANDSTONE [1]
☐-RIP/RAP [1]
☐-HARDPAN [0]
☐-SHALE [-1]
☐-COAL/ORE [-2]

SILT ORIGIN:

SUBSTRATE QUALITY Check ONE (or 2 & *AVERAGE*)
■-SILT HEAVY [-2]
☐-SILT MODERATE [-1]
☐-SILT NORMAL [0]
☐-SILT FREE [1]
☐-CLAY [-2]
☐-INDUSTRIAL [-1]
■-ORGANIC [1]
☐-NONE [1]

Substrate: 4 Max 20

NOTE Ignore sludge that originates from point-sources, score on natural substrates
NUMBER OF SUBSTRATE TYPES ☐-5 or More [2] ■-4 or Less [0]

COMMENTS _____

2] COVER TYPES **TYPE:** (Check All That Apply) **AMOUNT** (Check *ONLY* One or check2 and AVERAGE)

☐-OFF-SHORE SAND BARS [4]
☐-OVERHANGING VEGETATION [1]
■-SHALLOWS (ON BEACH) [1]
☐-ROOTMATS [1]
■-DEEP WATER > 1 M [1]
☐-ROOTWADS [1]
■-BOULDERS [1]
☐-SAND BEACH [1]
☐-WETLAND POOLS [1]
☐-SUBMERGED AQUATIC VEG. [4]
■-LOGS OR WOODY DEBRIS [1]
☐-GRAVEL BEACH [1]

☐-EXTENSIVE > 75% [9]
☐-MODERATE 25-75% [7]
■-SPARSE 5-25% [3]
☐-NEARLY ABSENT < 5% [1]

Cover: 7 Max 20

COMMENTS _____

3] SHORELINE MORPHOLOGY (Check *ONLY* one PER category or check 2 and *AVERAGE*)

SHORE SINUOSITY
☐-HIGH [2]
☐-MODERATE [4]
☐-LOW [3]
■-NONE [1]

DEVELOPMENT
☐-EXCELLENT [6]
☐-GOOD [5]
☐-FAIR [3]
■-POOR [1]

MODIFICATION
☐-NONE [7]
☐-RECOVERED [5]
☐-RECOVERING [3]
■-RECENT OR NO RECOVERY [1]

STABILITY
■-HIGH [3]
☐-MODERATE [2]
☐-LOW [1]

SHORE to BOTTOM SLOPE MORPHOLOGIES
☐-SLOPE < 15 deg. [0] ☐-SLOPE > 45 deg. [2]
■-SLOPE < 25 deg. [1] ☐-SLOPE 90 deg. [0]
☐-SLOPE > 25 deg. [3]

AVERAGE DEPTH (of 5 measures)
☐-< 50 cm [0] ☐-> 400 – 500 cm [4]
☐-50 - <100 cm [1] ☐-> 500 - 900 cm [2]
☐-≥100 - 200 cm [2] ☐->900 cm [1]
■->200 -4 00 cm [3]

MODIFICATIONS OF SAMPLED SHORELINE
☐-CEMENTED [-1]
☐-RIP RAPPED [1]
☐-RAILROAD TIES [-1]
■-DREDGED [-1]
■-TWO SIDE CHANNEL MODIFICATIONS [-1]
■-SHIP CHANNEL [-2]
■-STEEL BULKHEADS [-2]
☐-ISLANDS [1]
☐-DIKES [-1]
☐-BANK SHAPING [-1]
☐-WOOD PILINGS [1]

Shore Line: 4 Max 20

COMMENTS _____

★ Shore Right ~~Looking~~ East or South on Lake ★
★ Shore Right Looking Toward Lake in Lacustuary ★

4] RIPARIAN ZONE AND BANK EROSION (Check *ONE* box PER bank or 2 and *AVERAGE*)

RIPARIAN WIDTH L R (Per Bank)
☐☐-WIDE > 50 m [4]
☐☐-MODERATE 10-50 m [3]
☐☐-NARROW 5-10 m [2]
■■-VERY NARROW < 5 m [1]
☐☐-NONE [0]

SHORE LINE QUALITY (PAST 100 FOOT RIPARIAN) L R (Most Predominant Per Bank)
☐☐-FOREST, WETLAND, LAKE [3]
☐☐-SHRUB OR OLD FIELD [2]
☐☐-VINEYARD, ORCHARD [2]
☐☐-FENCED PASTURE [1]
☐☐-RESIDENTIAL, PARK, NEW FIELD [1]
☐☐-CONSERVATION TILLIAGE [1]
■■-URBAN OR INDUSTRIAL [0]
☐☐-OPEN PASUTRE, ROWCROP [0]
☐☐-MINING/CONSTRUCTION [0]
☐☐-DIKED WETLAND [0]

BANK EROSION L R (Per Bank)
■■-NONE/LITTLE [3]
☐☐-MODERATE [-1]
☐☐-HEAVY/SEVERE [-3]

Riparian: 4 Max 10

COMMENTS _____

5] AQUATIC VEGETATION QUALITY: PLANT SPECIES OBSERVED (Sum All Scores)
(Score all for observed abundance ABUNDANT = [3], COMMON = [5], FEW = [1], UNCOMMON = [0]) 1 NO AQUATIC VEGETATION = 0

____-Pond Lilies (NYMPHAEA) 1-Sedge (CYPERACEAE) ____-Wild Celery (VALLISNERIA)
____-Pond Weed (POTAMOGETON) 1-Bulrush (SCIRPUS) ____-Waterweed (ELODEA) ____-Wild Rice (ZIZANIA)

(Score all for observed abundance ABUNDANT = [-2], COMMON = [-1], FEW = [0])

____-Purple Loosestrife ____-Reed Grass ____-Eurasian Milfoil ____-Cattails ____-Algae (mats) ____-Algae (planktonic)

Vegetation: 2 Max 30

COMMENTS Gradient 0.180 ft/mile

Drainage 806 mi²

Is the Sampling Reach Representative of Area Habitat? (Y/N)____ If Not, Explain: _____

Depth measures: | | | | | | |

Zebra Mussel/Quagga Mussel Coverage ☐->60% ☐-60->25% ☐-25->10% ☐-<10->1% ☐-1-0%

	Gear	Distance	Water Clarity	Wave Height
First Sampling Pass:	_____	_____	_____	_____
Second Sampling Pass:	_____	_____	_____	_____
Third Sampling Pass:	_____	_____	_____	_____

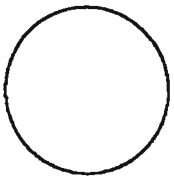
Subjective Rating (1-10) ☐ Aesthetic Rating (1-10) ☐

Photos: _____

WATERBODY MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ Maximum Depth: _____

DRAWING OF SITE:

North Arrow:



Lake / Lacustuary (Lentic) QHEI Field Sheet

Environmental Protection Agency QHEI Score: 10.5

RIVERCODE _____ RIVERMILE 0.20 WATERBODY CUYAHOGA RIVER DISTANCE ASSESSED (m): 0.50Km
DATE 8/25/15 LOCATION MOUTH / CONFLUENCE WITH LAKE ERIE
SCORER ZAMAKOSKY (ZABLOTNY) LAT. 41.5008 LONG. 81.7098 COMMENT SHIP CHANNEL

1] SUBSTRATE (Check *ONLY* Two Substrate TYPE BOXES; Estimate % or note every type present); LAKE: ____ LACUSTUARY: X

TYPE	SHORE	BOTTOM
☐☐-BLDR/SLABS [7]		
☐☐-BOULDER [10]		
☐☐-COBBLE [8]		
☐☐-GRAVEL [7]		✓
☐☐-SAND [6]		✓
☐☐-HARDPAN [4]		✓
☐☐-BEDROCK [3]		
☐☐-DETRITUS [3]		✓
☐☐-SILT [2]		✓
☒☒-MUCK [2]		✓

SUBSTRATE ORIGIN Check ONE (or 2 & *AVERAGE*)
☐-LIMESTONE [1]
☒-TILLS [1]
☐-WETLANDS [1]
☐-LACUSTUARINE [1]
☐-SANDSTONE [1]
☐-RIP/RAP [1]
☐-HARDPAN [0]
☐-SHALE [-1]
☐-COAL/ORE [-2]

SILT ORIGIN:

SUBSTRATE QUALITY Check ONE (or 2 & *AVERAGE*)
SILT
☐-SILT HEAVY [-2]
☒-SILT MODERATE [-1]
☐-SILT NORMAL [0]
☐-SILT FREE [1]
SILT
☒-CLAY [-2]
☐-INDUSTRIAL [-1]
☒-ORGANIC [1]
☐-NONE [1]

Substrate 5 Max 20

NOTE Ignore sludge that originates from point-sources; score on natural substrates
NUMBER OF SUBSTRATE TYPES: ☒-5 or More [2] ☐-4 or Less [0]

COMMENTS >20' DEEP - DIFFICULT TO ACCESS SUBSTRATE TYPES

2] COVER TYPES **TYPE:** (Check *All* That Apply) **AMOUNT** (Check *ONLY* One or check2 and AVERAGE)

TYPE		
☐-OFF-SHORE SAND BARS [4]	☒-DEEPWATER > 1 M [1]	☐-WETLAND POOLS [1]
☐-OVERHANGING VEGETATION [1]	☐-ROOTWADS [1]	☐-SUBMERGED AQUATIC VEG. [4]
☐-SHALLOWS (ON BEACH) [1]	☐-BOULDERS [1]	☐-LOGS OR WOODY DEBRIS [1]
☐-ROOTMATS [1]	☐-SAND BEACH [1]	☐-GRAVEL BEACH [1]

AMOUNT
☐-EXTENSIVE > 75% [9]
☐-MODERATE 25-75% [7]
☐-SPARSE 5-25% [3]
☒-NEARLY ABSENT < 5% [1]

Cover 2 Max 20

COMMENTS DREDGED CHANNEL ALL >20' IN DEPTH

3] SHORELINE MORPHOLOGY (Check *ONLY* one PER category or check 2 and *AVERAGE*)

SHORE SINUOSITY
☐-HIGH [2]
☐-MODERATE [4]
☐-LOW [3]
☒-NONE [1]

DEVELOPMENT
☐-EXCELLENT [5]
☐-GOOD [5]
☐-FAIR [3]
☒-POOR [1]

MODIFICATION
☐-NONE [7]
☐-RECOVERED [5]
☐-RECOVERING [3]
☒-RECENT OR NO RECOVERY [1]

STABILITY
☒-HIGH [3]
☐-MODERATE [2]
☐-LOW [1]

SHORE to BOTTOM SLOPE MORPHOLOGIES
☐-SLOPE < 15 deg. [0] ☐-SLOPE > 45 deg. [2]
☐-SLOPE < 25 deg. [1] ☒-SLOPE 90 deg. [0]
☐-SLOPE > 25 deg. [3]

AVERAGE DEPTH (of 5 measures)
☐-<50 cm [0] ☐->400 – 500 cm [4]
☐-50 - <100 cm [1] ☐->500 - 900 cm [2]
☐-≥100 - 200 cm [2] ☒->900 cm [1]
☐->200 -4 00 cm [3]

MODIFICATIONS OF SAMPLED SHORELINE
☐-CEMENTED [-1] ☒-STEEL BULKHEADS [-2]
☐-RIP RAPPED [1] ☐-ISLANDS [1]
☐-RAILROAD TIES [-1] ☐-DIKES [-1]
☒-DREDGED [-1] ☒-BANK SHAPING [-1]
☒-TWO SIDE CHANNEL MODIFICATIONS [-1] ☐-WOOD PILINGS [1]
☒-SHIP CHANNEL [-2]

Shore Line 0 Max 20

COMMENTS

★ Shore Right Looking East or South on Lake ★
★ Shore Right Looking Toward Lake in Lacustuary ★

4] RIPARIAN ZONE AND BANK EROSION (Check *ONE* box PER bank or 2 and *AVERAGE*)

RIPARIAN WIDTH L R (Per Bank)
☐☐-WIDE > 50 m [4]
☐☐-MODERATE 10-50 m [3]
☐☐-NARROW 5-10 m [2]
☐☐-VERY NARROW < 5 m [1]
☒☒-NONE [0]

SHORE LINE QUALITY (PAST 100 FOOT RIPARIAN) L R (Most Predominant Per Bank)
☐☐-FOREST, WETLAND, LAKE [3]
☐☐-SHRUB OR OLD FIELD [2]
☐☐-VINEYARD, ORCHARD [2]
☐☐-FENCED PASTURE [1]
☒☐-RESIDENTIAL, PARK, NEW FIELD [1]
☐☐-CONSERVATION TILLIAGE [1]
☐☒-URBAN OR INDUSTRIAL [0]
☐☐-OPEN PASUTRE, ROW CROP [0]
☐☐-MINING/CONSTRUCTION [0]
☐☐-DIKED WETLAND [0]

BANK EROSION L R (Per Bank)
☒☒-NONE/LITTLE [3]
☐☐-MODERATE [-1]
☐☐-HEAVY/SEVERE [-3]

Riparian 3.5 Max 10

COMMENTS

5] AQUATIC VEGETATION QUALITY: PLANT SPECIES OBSERVED (Sum All Scores)
(Score all for observed abundance ABUNDANT = [3], COMMON = [5], FEW = [1], UNCOMMON = [0])
6 NO AQUATIC VEGETATION = 0

____-Pond Lilies (NYMPHAEA)	6-Sedge (CYPERACEAE)	____-Wild Celery (VALLISNERIA)	
____-Pond Weed (POTAMOGETON)	6-Bulrush (SCIRPUS)	____-Waterweed (ELODEA)	____-Wild Rice (ZIZANIA)

(Score all for observed abundance ABUNDANT = [-2], COMMON = [-1], FEW = [0])

____-Purple Loosestrife	____-Reed Grass	____-Eurasian Milfoil	____-Cattails	____-Algae (mats)	____-Algae (planktonic)

Vegetation 0 Max 30

COMMENTS NONE PRESENT

Is the Sampling Reach Representative of Area Habitat? (Y/N)____ If Not, Explain: _____

Depth measures: | | | | | | |

Zebra Mussel/Quagga Mussel Coverage ☐->60% ☐-60->25% ☐-25->10% ☐-<10->1% ☐-1-0%

	Gear	Distance	Water Clarity	Wave Height
First Sampling Pass:	_____	_____	_____	_____
Second Sampling Pass:	_____	_____	_____	_____
Third Sampling Pass:	_____	_____	_____	_____

Subjective Rating (1-10) ☐ Aesthetic Rating (1-10) ☐

Photos: _____

WATERBODY MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ Maximum Depth: _____

DRAWING OF SITE:

North Arrow: