

# Large Filing Separator Sheet

Case Number: 11-4248-EL-BTX

File Date: 8/17/2012

Section: 2 of 3

Number of Pages: 200

Description of Document: Application

Pr-w26

Site: w-bao-083011-01

Rater(s): bao

Date: 8/30/2011

1

max 6 pts

1

subtotal

**Metric 1. Wetland Area (size).**

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☒ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☐ <0.1 acres (0.04ha) (0 pts)

3

max 14 pts

4

subtotal

**Metric 2. Upland buffers and surrounding land use.**

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- ☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

9

max 30 pts

13

subtotal

**Metric 3. Hydrology.**

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☒ Part of wetland/upland (e.g. forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☐ Seasonally inundated (2)
- ☒ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- ☒ ditch
- ☐ tile
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ Other:

12

max 20 pts

25

subtotal

**Metric 4. Habitat Alteration and Development.**

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☒ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☒ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☒ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ woody debris removal
- ☐ toxic pollutants
- ☒ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ sedimentation
- ☐ dredging
- ☐ farming
- ☐ nutrient enrichment

25

Subtotal this page

Site: w-bao-083011-01

Rater(s): bao

Date: 8/30/2011

3

Subtotal this page

0

max 10 pts

0

subtotal

**Metric 5. Special Wetlands.**

Check all that apply and score as indicated.

- ☐ Bog (10)  
☐ Fen (10)  
☐ Old growth forest (10)  
☐ Mature forested wetland (5)  
☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)  
☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)  
☐ Lake Plain Sand Prairies (Oak Openings) (10)  
☐ Relict Wet Praires (10)  
☐ Known occurrence state/federal threatened or endangered species (10)  
☐ Significant migratory songbird/water fowl habitat or usage (10)  
☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

3

max 20 pts

3

subtotal

**Metric 6. Plant communities, interspersions, microtopography.****6a. Wetland Vegetation Communities.**

Score all present using 0 to 3 scale.

- ☐ Aquatic bed  
☐ Emergent  
☐ Shrub  
☐ Forest  
☐ Mudflats  
☐ Open Water  
☐ Other

**6b. horizontal (plan view) Interspersion.**

Select only one.

- ☐ High (5)  
☐ Moderately high(4)  
☒ Moderate (3)  
☐ Moderately low (2)  
☐ Low (1)  
☐ None (0)

**6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage**

- ☐ Extensive >75% cover (-5)  
☒ Moderate 25-75% cover (-3)  
☐ Sparse 5-25% cover (-1)  
☐ Nearly absent <5% cover (0)  
☐ Absent (1)

**6d. Microtopography.**

Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks  
☐ Coarse woody debris >15cm (6in)  
☐ Standing dead >25cm (10in) dbh  
☐ Amphibian breeding pools

**Vegetation Community Cover Scale**

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

**Narrative Description of Vegetation Quality**

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

**Mudflat and Open Water Class Quality**

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

**Microtopography Cover Scale**

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

28

GRAND TOTAL(max 100 pts)

Category: 1

Pr-w27

Site: <b>w-bao-083011-02</b>	Rater(s): <b>bao</b>	Date: <b>8/30/2011</b>
------------------------------	----------------------	------------------------

<b>1</b>	<b>1</b>
max 6 pts	subtotal

### Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☒ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☐ <0.1 acres (0.04ha) (0 pts)

<b>3</b>	<b>4</b>
max 14 pts	subtotal

### Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- ☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

<b>9</b>	<b>13</b>
max 30 pts	subtotal

### Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☒ Part of wetland/upland (e.g. forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☐ Seasonally inundated (2)
- ☒ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input type="checkbox"/> ditch            | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile             | <input type="checkbox"/> filling/grading              |
| <input type="checkbox"/> dike             | <input type="checkbox"/> road bed/RR track            |
| <input type="checkbox"/> weir             | <input type="checkbox"/> dredging                     |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other:                       |

<b>12</b>	<b>25</b>
max 20 pts	subtotal

### Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☒ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☒ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> mowing    | <input checked="" type="checkbox"/> shrub/sapling removal |
| <input type="checkbox"/> grazing              | <input type="checkbox"/> herbaceous/aquatic bed removal   |
| <input type="checkbox"/> clearcutting         | <input type="checkbox"/> sedimentation                    |
| <input type="checkbox"/> selective cutting    | <input type="checkbox"/> dredging                         |
| <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming                          |
| <input type="checkbox"/> toxic pollutants     | <input type="checkbox"/> nutrient enrichment              |

<b>25</b>
-----------

Subtotal this page



Site: w-bao-083011-02

Rater(s): bao

Date: 8/30/2011

2

Subtotal this page

0

max 10 pts

0

subtotal

**Metric 5. Special Wetlands.**

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

2

max 20 pts

2

subtotal

**Metric 6. Plant communities, interspersions, microtopography.****6a. Wetland Vegetation Communities.**

Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☒ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open Water
- ☐ Other

**6b. horizontal (plan view) Interspersion.**

Select only one.

- ☐ High (5)
- ☐ Moderately high (4)
- ☒ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☐ None (0)

**6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage**

- ☐ Extensive >75% cover (-5)
- ☒ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

**6d. Microtopography.**

Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15cm (6in)
- ☐ Standing dead >25cm (10in) dbh
- ☐ Amphibian breeding pools

**Vegetation Community Cover Scale**

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

**Narrative Description of Vegetation Quality**

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

**Mudflat and Open Water Class Quality**

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

**Microtopography Cover Scale**

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

27

**GRAND TOTAL(max 100 pts)**

Category: 1

Site: <b>w-bao-083011-03</b>	Rater(s): <b>bao</b>	Date: <b>8/30/2011</b>
------------------------------	----------------------	------------------------

<b>1</b>	<b>1</b>
max 6 pts	subtotal

### Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☒ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☐ <0.1 acres (0.04ha) (0 pts)

<b>1</b>	<b>2</b>
max 14 pts	subtotal

### Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

<b>8</b>	<b>10</b>
max 30 pts	subtotal

### Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☐ Seasonally inundated (2)
- ☒ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input type="checkbox"/> ditch            | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile             | <input type="checkbox"/> filling/grading              |
| <input type="checkbox"/> dike             | <input type="checkbox"/> road bed/RR track            |
| <input type="checkbox"/> weir             | <input type="checkbox"/> dredging                     |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other:                       |

<b>11</b>	<b>21</b>
max 20 pts	subtotal

### Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☒ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☒ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> mowing    | <input checked="" type="checkbox"/> shrub/sapling removal |
| <input type="checkbox"/> grazing              | <input type="checkbox"/> herbaceous/aquatic bed removal   |
| <input type="checkbox"/> clearcutting         | <input type="checkbox"/> sedimentation                    |
| <input type="checkbox"/> selective cutting    | <input type="checkbox"/> dredging                         |
| <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming                          |
| <input type="checkbox"/> toxic pollutants     | <input type="checkbox"/> nutrient enrichment              |

<b>21</b>
-----------

Subtotal this page

Site: **w-bao-083011-03** Rater(s): **bao** Date: **8/30/2011**

**1**

Subtotal this page

**0** **0**  
max 10 pts subtotal

### Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

**1** **1**  
max 20 pts subtotal

### Metric 6. Plant communities, interspersions, microtopography.

#### 6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 1 Emergent
- ☐ 1 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open Water
- ☐ 0 Other

#### 6b. horizontal (plan view) Interspersion.

Select only one.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☒ Moderately low (2)
- ☐ Low (1)
- ☐ None (0)

#### 6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☒ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

#### 6d. Microtopography.

Score all present using 0 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

#### Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

#### Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

#### Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

#### Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

**22** GRAND TOTAL(max 100 pts)

Category: **II**

**APPENDIX C**  
**OHIO EPA QHEI STREAM FORMS**

YF-2016

QUARRY CREEK

QH-MDF08311-016



# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score:

58

Stream & Location: DE DDB PREFERRED ROUTE & ALTERNATE ROUTE RM:      Date: 06/30/11

Scorers Full Name & Affiliation: B. OTTO, M. THOMAYER, URS CORP  
 River Code:      STORET #:      Lat./Long.:      18 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		ORIGIN		QUALITY		Substrate Maximum 20
<input type="checkbox"/>	BUDRYSLABS [10]	<input type="checkbox"/>		<input type="checkbox"/>	HARDPAN [4]	<input type="checkbox"/>		<input type="checkbox"/>	LIMESTONE [1]	<input type="checkbox"/>	HEAVY [2]	
<input type="checkbox"/>	BOULDER [10]	<input type="checkbox"/>		<input type="checkbox"/>	DETRITUS [3]	<input type="checkbox"/>		<input type="checkbox"/>	FILLS [1]	<input type="checkbox"/>	MODERATE [-1]	
<input type="checkbox"/>	COBBLE [8]	<input type="checkbox"/>		<input type="checkbox"/>	MUCK [2]	<input type="checkbox"/>		<input type="checkbox"/>	WETLANDS [0]	<input checked="" type="checkbox"/>	NORMAL [0]	
<input checked="" type="checkbox"/>	GRAVEL [7]	<u>30</u>	<u>30</u>	<input type="checkbox"/>	SILT [2]	<input type="checkbox"/>	<u>30</u> <u>10</u>	<input type="checkbox"/>	HARDPAN [0]	<input type="checkbox"/>	FREE [3]	
<input type="checkbox"/>	SAND [6]	<input type="checkbox"/>		<input type="checkbox"/>	ARTIFICIAL [0]	<input type="checkbox"/>		<input type="checkbox"/>	SANDSTONE [0]	<input type="checkbox"/>	EXTENSIVE [-2]	
<input checked="" type="checkbox"/>	BEDROCK [5]	<u>40</u>	<u>60</u>					<input type="checkbox"/>	RUP/RAP [0]	<input type="checkbox"/>	MODERATE [-1]	
NUMBER OF BEST TYPES: <input type="checkbox"/> 2 or more [2] <input checked="" type="checkbox"/> 3 or less [0]				(Score natural substrates; ignore sludge from point-sources)				<input type="checkbox"/>	LACUSTURINE [0]	<input checked="" type="checkbox"/>	NORMAL [0]	
Comments								<input type="checkbox"/>	SHALE [1]	<input type="checkbox"/>	NONE [1]	
								<input type="checkbox"/>	COAL FINES [-2]			

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.

		AMOUNT	
<u>1</u>	UNDERCUT BANKS [1]	<input type="checkbox"/>	EXTENSIVE >75% [11]
<u>2</u>	OVERHANGING VEGETATION [1]	<input checked="" type="checkbox"/>	MODERATE 25-75% [7]
<u>    </u>	SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/>	SPARSE 5-25% [3]
<u>    </u>	ROOTMATS [4]	<input type="checkbox"/>	NEARLY ABSENT <5% [1]
Comments		Cover Maximum 20 11	
<u>    </u>	POOLS > 70cm [2]	<input type="checkbox"/>	
<u>1</u>	ROOTWADS [1]	<input type="checkbox"/>	
<u>    </u>	BOULDERS [1]	<input type="checkbox"/>	
<u>    </u>	OXBOWS, BACKWATERS [1]	<input type="checkbox"/>	
<u>    </u>	AQUATIC MACROPHYTES [1]	<input type="checkbox"/>	
<u>    </u>	LOGS OR WOODY DEBRIS [1]	<input type="checkbox"/>	

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

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]
<input checked="" type="checkbox"/> MODERATE [3]	<input checked="" type="checkbox"/> GOOD [5]	<input checked="" type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]
<input type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	
Comments			
Channel Maximum 20 14			

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

RIPARIAN WIDTH		FLOOD PLAIN QUALITY	
<input type="checkbox"/> EROSION	<input type="checkbox"/> WIDE > 50m [4]	<input checked="" type="checkbox"/> FOREST / SWAMP [3]	<input type="checkbox"/> CONSERVATION TILLAGE [1]
<input checked="" type="checkbox"/> NONE / LITTLE [3]	<input checked="" type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]
<input checked="" type="checkbox"/> MODERATE [2]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL PARK-NEW FIELD [1]	<input type="checkbox"/> MINING / CONSTRUCTION [0]
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]	
	<input type="checkbox"/> NONE [0]	<input type="checkbox"/> OPEN PASTURE, ROWCROP [0]	
Comments		Indicate predominant land use(s) past 100m riparian. Riparian Maximum 10 8	

5) **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	Recreation Potential
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply	Primary Contact
<input type="checkbox"/> > 1m [6]	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> TORRENTIAL [-1]	Secondary Contact
<input type="checkbox"/> 0.7-1m [4]	<input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input checked="" type="checkbox"/> SLOW [1]	(circle one and comment on back)
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]	<input type="checkbox"/> VERY FAST [1]	
<input type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> FAST [1]	
<input checked="" type="checkbox"/> < 0.2m [0]		<input type="checkbox"/> MODERATE [1]	
Comments		Indicate for reach - pools and riffles.	Pool / Current Maximum 12 2

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input checked="" type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]
<input type="checkbox"/> BEST AREAS 5-10cm [1]	<input checked="" type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input checked="" type="checkbox"/> LOW [1]
<input checked="" type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
Comments			<input type="checkbox"/> EXTENSIVE [-1]
			Riffle / Run Maximum 8 4

6) **GRADIENT**

DRAINAGE AREA	Gradient	% POOL	% GLIDE	% RUN	% RIFFLE	Gradient Maximum
(ft/mi)	<input type="checkbox"/> VERY LOW - LOW [2-4]	<u>40</u>	<u>    </u>	<u>30</u>	<u>30</u>	10
(mi <sup>2</sup> )	<input checked="" type="checkbox"/> MODERATE [6-10]					8
	<input type="checkbox"/> HIGH - VERY HIGH [10-5]					

Check ALL that apply

**METHOD**

**STAGE**

Small Fish & minnows observed

☐ BOAT

1st sample pass- 2nd

☐ MADE

☐ HIGH

☐ LINE

☐ UP

☐ OTHER

☐ NORMAL

☐ DISTANCE

☐ LOW

☐ DRY

☐ DRY

☐ CLARITY

☐ CLARITY

☐ B/AESTHETICS

☐ B/AESTHETICS

☐ D/J MAINTENANCE

☐ D/J MAINTENANCE

☐ E/J ISSUES

☐ E/J ISSUES

☐ F/J MEASUREMENT

☐ F/J MEASUREMENT

☐ CANOPY

☐ CANOPY

☐ C/J RECREATION

☐ C/J RECREATION

☐ POOL

☐ POOL

☐ AREA DEPTH

☐ AREA DEPTH

☐ TRASH / LITTER

☐ TRASH / LITTER

☐ NUISANCE ALGAE

☐ NUISANCE ALGAE

☐ INVASIVE MACROPHYTES

☐ INVASIVE MACROPHYTES

☐ EXCESS TURBIDITY

☐ EXCESS TURBIDITY

☐ DISCOLORATION

☐ DISCOLORATION

☐ FOAM / SCUM

☐ FOAM / SCUM

☐ OIL SHEEN

☐ OIL SHEEN

☐ PUBLIC / PRIVATE / BOTH / NA

☐ PUBLIC / PRIVATE / BOTH / NA

☐ ACTIVE / HISTORIC / BOTH / NA

☐ ACTIVE / HISTORIC / BOTH / NA

☐ YOUNG-SUCCESSION-OLD

☐ YOUNG-SUCCESSION-OLD

☐ SPRAY / SNAG / REMOVED

☐ SPRAY / SNAG / REMOVED

☐ MODIFIED / DIPPED OUT / NA

☐ MODIFIED / DIPPED OUT / NA

☐ LEVEED / ONE SIDED

☐ LEVEED / ONE SIDED

☐ RELOCATED / CUTOFFS

☐ RELOCATED / CUTOFFS

☐ MOVING-BEDLOAD-STABLE

☐ MOVING-BEDLOAD-STABLE

☐ ARMoured / SLUMPS

☐ ARMoured / SLUMPS

☐ ISLANDS / SCURED

☐ ISLANDS / SCURED

☐ IMPOUNDED / DESICCATED

☐ IMPOUNDED / DESICCATED

☐ FLOOD CONTROL / DRAINAGE

☐ FLOOD CONTROL / DRAINAGE

☐ WWTP / CSO / NPDES / INDUSTRY

☐ WWTP / CSO / NPDES / INDUSTRY

☐ HARDENED / URBAN / DIRT&GRIME

☐ HARDENED / URBAN / DIRT&GRIME

☐ CONTAMINATED / LANDFILL

☐ CONTAMINATED / LANDFILL

☐ BMPs-CONSTRUCTION-SEDIMENT

☐ BMPs-CONSTRUCTION-SEDIMENT

☐ LOGGING / IRRIGATION / COOLING

☐ LOGGING / IRRIGATION / COOLING

☐ BANK / EROSION / SURFACE

☐ BANK / EROSION / SURFACE

☐ FALSE BANK / MANURE / LAGOON

☐ FALSE BANK / MANURE / LAGOON

☐ WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE

☐ WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE

☐ ACID / MINE / QUARRY / FLOW

☐ ACID / MINE / QUARRY / FLOW

☐ NATURAL / WETLAND / STAGNANT

☐ NATURAL / WETLAND / STAGNANT

☐ PARK / GOLF / LAWN / HOME

☐ PARK / GOLF / LAWN / HOME

☐ ATMOSPHERE / DATA PAUCITY

☐ ATMOSPHERE / DATA PAUCITY

☐ Legacy Tree:

☐ Legacy Tree:

☐ bankfull max. depth

☐ bankfull max. depth

☐ floodprone x<sup>2</sup> width

☐ floodprone x<sup>2</sup> width

☐ entrench. ratio

☐ entrench. ratio

☐ W/D ratio

☐ W/D ratio

☐ bankfull x depth

☐ bankfull x depth

☐ max. depth - 5"

☐ max. depth - 5"

☐ x depth 3-4"

☐ x depth 3-4"

☐ x width - 15"

☐ x width - 15"

☐ Legacy Tree:

☐ Legacy Tree:

☐ bankfull max. depth

☐ bankfull max. depth

☐ floodprone x<sup>2</sup> width

☐ floodprone x<sup>2</sup> width

☐ entrench. ratio

☐ entrench. ratio

☐ W/D ratio

☐ W/D ratio

☐ bankfull x depth

☐ bankfull x depth

☐ max. depth - 5"

☐ max. depth - 5"

☐ x depth 3-4"

☐ x depth 3-4"

☐ x width - 15"

☐ x width - 15"

☐ Legacy Tree:

☐ Legacy Tree:

☐ bankfull max. depth

☐ bankfull max. depth

☐ floodprone x<sup>2</sup> width

☐ floodprone x<sup>2</sup> width

☐ entrench. ratio

☐ entrench. ratio

☐ W/D ratio

☐ W/D ratio

☐ bankfull x depth

☐ bankfull x depth

☐ max. depth - 5"

☐ max. depth - 5"

☐ x depth 3-4"

☐ x depth 3-4"

☐ x width - 15"

☐ x width - 15"

☐ Legacy Tree:

☐ Legacy Tree:

☐ bankfull max. depth

☐ bankfull max. depth

☐ floodprone x<sup>2</sup> width

☐ floodprone x<sup>2</sup> width

☐ entrench. ratio

☐ entrench. ratio

☐ W/D ratio

☐ W/D ratio

☐ bankfull x depth

☐ bankfull x depth

☐ max. depth - 5"

☐ max. depth - 5"

☐ x depth 3-4"

☐ x depth 3-4"

☐ x width - 15"

☐ x width - 15"

☐ Legacy Tree:

☐ Legacy Tree:

☐ bankfull max. depth

☐ bankfull max. depth

☐ floodprone x<sup>2</sup> width

☐ floodprone x<sup>2</sup> width

☐ entrench. ratio

☐ entrench. ratio

☐ W/D ratio

☐ W/D ratio

☐ bankfull x depth

☐ bankfull x depth

☐ max. depth - 5"

☐ max. depth - 5"

☐ x depth 3-4"

☐ x depth 3-4"

☐ x width - 15"

☐ x width - 15"

☐ Legacy Tree:

☐ Legacy Tree:

☐ bankfull max. depth

☐ bankfull max. depth

☐ floodprone x<sup>2</sup> width

☐ floodprone x<sup>2</sup> width

☐ entrench. ratio

☐ entrench. ratio

☐ W/D ratio

☐ W/D ratio

☐ bankfull x depth

☐ bankfull x depth

☐ max. depth - 5"

☐ max. depth - 5"

☐ x depth 3-4"

☐ x depth 3-4"

☐ x width - 15"

☐ x width - 15"

☐ Legacy Tree:

☐ Legacy Tree:

☐ bankfull max. depth

☐ bankfull max. depth

☐ floodprone x<sup>2</sup> width

☐ floodprone x<sup>2</sup> width

☐ entrench. ratio

☐ entrench. ratio

☐ W/D ratio

☐ W/D ratio

☐ bankfull x depth

☐ bankfull x depth

☐ max. depth - 5"

☐ max. depth - 5"

☐ x depth 3-4"

☐ x depth 3-4"

☐ x width - 15"

☐ x width - 15"

☐ Legacy Tree:

☐ Legacy Tree:

☐ bankfull max. depth

☐ bankfull max. depth

☐ floodprone x<sup>2</sup> width

☐ floodprone x<sup>2</sup> width

☐ entrench. ratio

☐ entrench. ratio

☐ W/D ratio

☐ W/D ratio

☐ bankfull x depth

☐ bankfull x depth

☐ max. depth - 5"

☐ max. depth - 5"

☐ x depth 3-4"

☐ x depth 3-4"

☐ x width - 15"

☐ x width - 15"

☐ Legacy Tree:

☐ Legacy Tree:

☐ bankfull max. depth

☐ bankfull max. depth

☐ floodprone x<sup>2</sup> width

☐ floodprone x<sup>2</sup> width

☐ entrench. ratio

☐ entrench. ratio

☐ W/D ratio

☐ W/D ratio

☐ bankfull x depth

☐ bankfull x depth

☐ max. depth - 5"

☐ max. depth - 5"

☐ x depth 3-4"

☐ x depth 3-4"

☐ x width - 15"

☐ x width - 15"

☐ Legacy Tree:

☐ Legacy Tree:

☐ bankfull max. depth

☐ bankfull max. depth

☐ floodprone x<sup>2</sup> width

☐ floodprone x<sup>2</sup> width

☐ entrench. ratio

☐ entrench. ratio

☐ W/D ratio

☐ W/D ratio

☐ bankfull x depth

☐ bankfull x depth

☐ max. depth - 5"

☐ max. depth - 5"

☐ x depth 3-4"

☐ x depth 3-4"

☐ x width - 15"

☐ x width - 15"

☐ Legacy Tree:

☐ Legacy Tree:

☐ bankfull max. depth

☐ bankfull max. depth

☐ floodprone x<sup>2</sup> width

☐ floodprone x<sup>2</sup> width

☐ entrench. ratio

☐ entrench. ratio

☐ W/D ratio

☐ W/D ratio

☐ bankfull x depth

☐ bankfull x depth

☐ max. depth - 5"

☐ max. depth - 5"

☐ x depth 3-4"

☐ x depth 3-4"

☐ x width - 15"

☐ x width - 15"

☐ Legacy Tree:

Pr-501c

Murray Creek

QH - B40083011-1



# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: **56.5**Stream & Location: gh-620 08/30/11-1, BDB preferred route RM: --- Date: 8/30/11River Code: --- STORET #: --- Lat./Long.: --- (NAD 83 - decimal) 18 Office verified location ☐Scorers Full Name & Affiliation: U. Thomayer; URS Corp.1] **SUBSTRATE** Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 &amp; average)

BEST TYPES		OTHER TYPES		ORIGIN		QUALITY	
<input type="checkbox"/> BLDR / SLABS [10]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE	<input checked="" type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT	<input type="checkbox"/> HEAVY [-2]	Substrate <div style="border: 1px solid black; padding: 5px; text-align: center;">14</div> Maximum 20
<input type="checkbox"/> BOULDER [9]	<u>40</u> <u>40</u>	<input type="checkbox"/> DETRITUS [3]	<u>10</u> <u>10</u>	<input type="checkbox"/> TILLS [1]	<input checked="" type="checkbox"/> MODERATE [-1]	<input type="checkbox"/> NORMAL [0]	
<input checked="" type="checkbox"/> COBBLE [8]	<u>25</u> <u>25</u>	<input type="checkbox"/> MUCK [2]	<u>5</u> <u>5</u>	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> FREE [1]	<input type="checkbox"/> EXTENSIVE [-2]	
<input checked="" type="checkbox"/> GRAVEL [7]	<u>70</u> <u>70</u>	<input type="checkbox"/> SILT [2]	<u>70</u> <u>70</u>	<input type="checkbox"/> HARDPAN [0]	<input checked="" type="checkbox"/> MODERATE [-1]	<input type="checkbox"/> NORMAL [0]	
<input type="checkbox"/> SAND [6]	<u>---</u> <u>---</u>	<input type="checkbox"/> ARTIFICIAL [0]	<u>---</u> <u>---</u>	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> NONE [1]	<input type="checkbox"/> NONE [1]	
<input type="checkbox"/> BEDROCK [5]	<u>---</u> <u>---</u>	(Score natural substrates; ignore sludge from point-sources)		<input type="checkbox"/> RIP/RAP [0]	EMBEDDEDNESS		
NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more [2] <input checked="" type="checkbox"/> 3 or less [0]				<input type="checkbox"/> LACUSTURINE [0]			
Comments				<input type="checkbox"/> SHALE [-1]			
				<input type="checkbox"/> COAL FINES [-2]			

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.

AMOUNT

Check ONE (Or 2 &amp; average)

<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70cm [2]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]	<input type="checkbox"/> EXTENSIVE >75% [11]
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> AQUATIC MACROPHYTES [1]	<input type="checkbox"/> MODERATE 25-75% [7]
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> LOGS OR WOODY DEBRIS [1]	<input checked="" type="checkbox"/> SPARSE 5-<25% [3]
<input type="checkbox"/> ROOTMATS [1]			<input type="checkbox"/> NEARLY ABSENT <5% [1]

Cover  
Maximum  
20

Comments

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

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input checked="" type="checkbox"/> NONE [6]	<input checked="" type="checkbox"/> HIGH [3]
<input checked="" type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]
<input type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	

Channel  
Maximum  
20

Comments

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

River right looking downstream

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

Indicate predominant land use(s)  
past 100m riparian. Riparian  
Maximum  
10

Comments

5] **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH

CHANNEL WIDTH

CURRENT VELOCITY

Check ONE (ONLY)

Check ONE (Or 2 &amp; average)

Check ALL that apply

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

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

- ☐ 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)

Pool /  
Current  
Maximum  
12

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 &amp; average).

☐ NO RIFFLE [metric=0]

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

Riffle /  
Run  
Maximum  
8

Comments

6] **GRADIENT** (4.88 ft/mi)  
**DRAINAGE AREA** (2.34 mi<sup>2</sup>)

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

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

Gradient  
Maximum  
10

$$10 \text{ ft} / 2.05 \text{ mi} = 4.88$$

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

## AJ SAMPLED REACH

Check ALL that apply

### METHOD

- ☐ BOAT  
☐ WADE  
☐ UP  
☐ L' LINE  
☒ NORMAL  
☐ LOW  
☐ DRY

### 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

20' meters

CANOPY

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

### CJ RECREATION

POOL: ☐ > 100R2 ☐ > 3ft

### BJ AESTHETICS

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

### DJ 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  
☐ ARMORED / SLUMPS  
☐ ISLANDS / SCOURED  
☐ IMPOUNDED / DESICCATED  
☐ FLOOD CONTROL / DRAINAGE

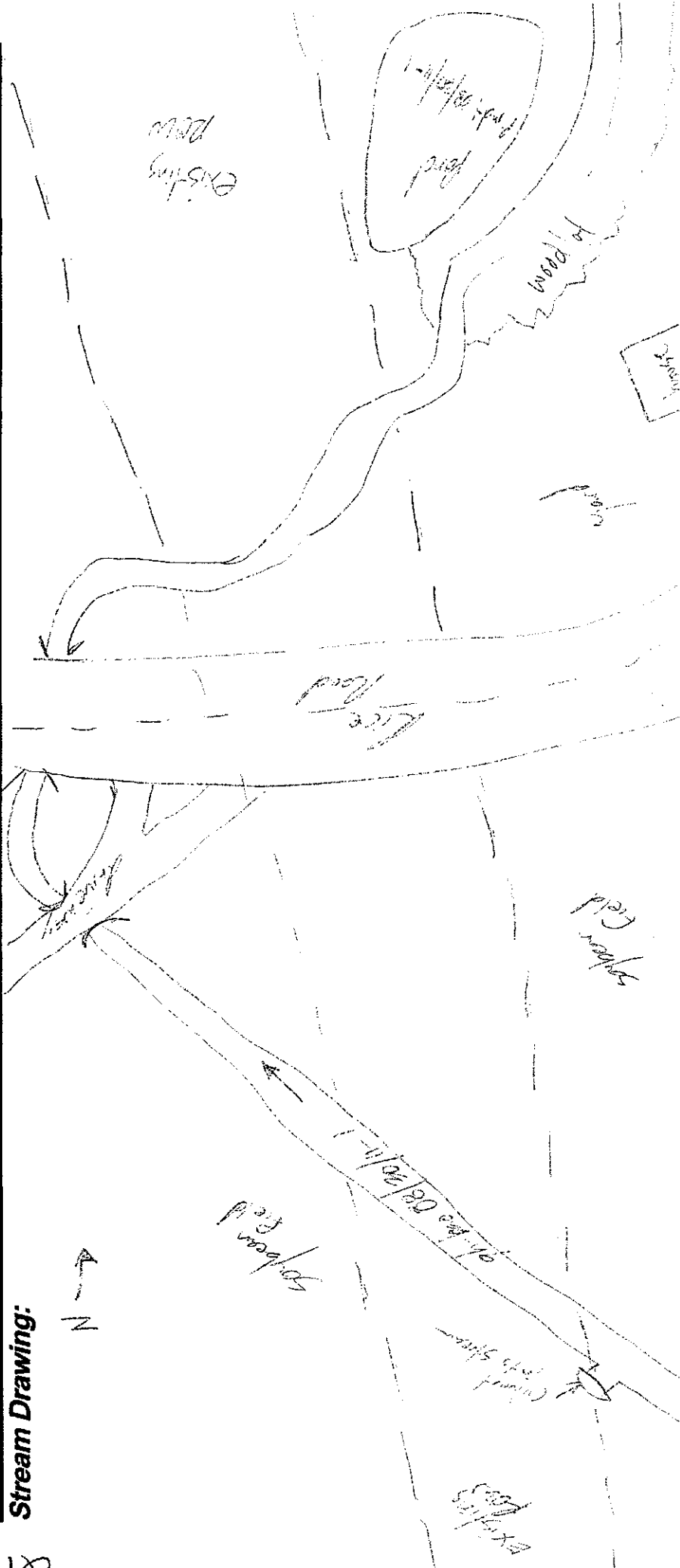
### EJ ISSUES

- 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<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
ACID / MINE / QUARRY / FLOW  
NATURAL / WETLAND / STAGNANT  
PARK / GOLF / LAWN / HOME  
ATMOSPHERE / DATA PAUCITY

### FJ MEASUREMENTS

- ☐ width  
☐ depth  
max. depth  
☐ bankfull width  
☐ bankfull x depth  
W/D ratio  
bankfull max. depth  
floodprone x<sup>2</sup> width  
entrench. ratio  
Legacy Tree:

## Stream Drawing:





**APPENDIX D**  
**OHIO EPA HHEI STREAM FORMS**

P-502

hh-md-051911-3



## Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3):

15

SITE NAME/LOCATION FE - Beaver Davis Besse Preferred RouteSITE NUMBER hh-md-051911-3 RIVER BASIN \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_LENGTH OF STREAM REACH (ft) 50' LAT. \_\_\_\_\_ LONG. \_\_\_\_\_ RIVER CODE \_\_\_\_\_ RIVER MILE \_\_\_\_\_DATE 19 May 2011 SCORER H. Thomey COMMENTS \_\_\_\_\_

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☒ RECENT OR NO RECOVERYMODIFICATIONS: Busted drain tile that has created a channel when above ground

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input checked="" type="checkbox"/> SILT [3 pt]	<u>45</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	_____
<input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> FINE DETRITUS [3 pts]	_____
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]	<u>55</u>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	_____	<input type="checkbox"/> MUCK [0 pts]	_____
<input type="checkbox"/> SAND (<2 mm) [6 pts]	_____	<input type="checkbox"/> ARTIFICIAL [3 pts]	_____

Total of Percentages of  
Bltr Slabs, Boulder, Cobble, Bedrock 0(A) 3(B) 2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
PointsSubstrate  
Max = 40

5

A + B

Pool Depth  
Max = 30

5

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input checked="" type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

2"

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]	

COMMENTS \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters):

2'

Bankfull  
Width  
Max=30

5

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

## RIPARIAN WIDTH

L	R	(Per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	None

COMMENTS \_\_\_\_\_

## FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

- FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

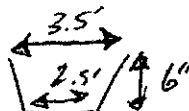
<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS Ephemeral

- SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

## STREAM GRADIENT ESTIMATE

☐ Flat (0.5 ft/100 ft) ☒ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)


**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**

QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)

**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_  
☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_  
☐ EWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order \_\_\_\_\_

County: \_\_\_\_\_ Township / City: \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/18/11 Quantity: Unknown

Photograph Information: 2 : USADS

Elevated Turbidity? (Y/N): N Canopy (% open): 100

Were samples collected for water chemistry? (Y/N): \_\_\_\_\_ (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH (S.U.) \_\_\_\_\_ Conductivity (µmhos/cm) \_\_\_\_\_

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

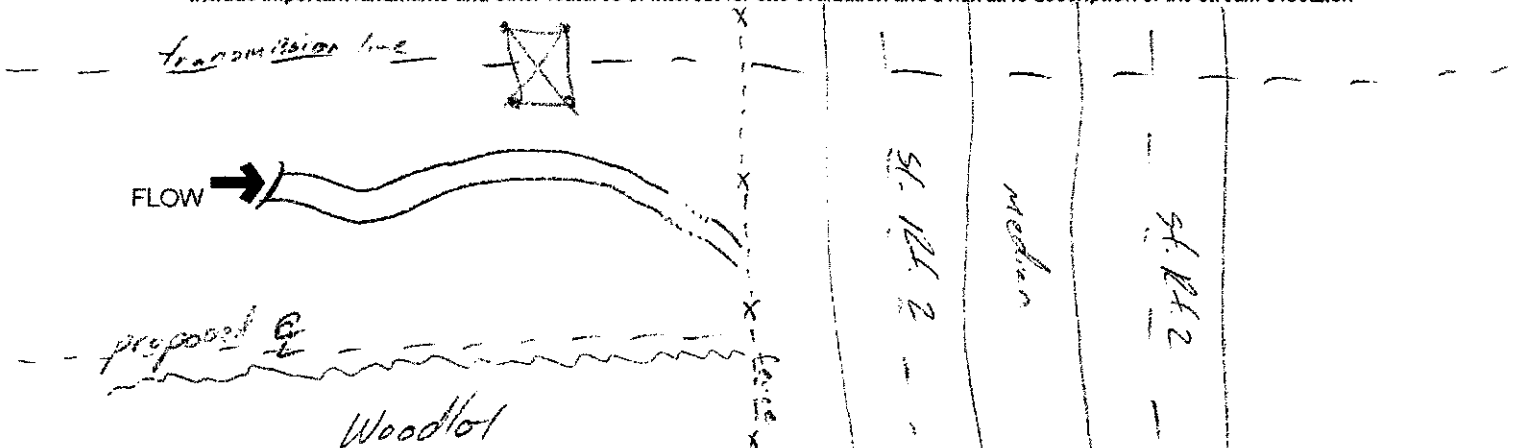
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N  
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: \_\_\_\_\_

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



**APPENDIX E**  
**DELINEATED FEATURES PHOTOGRAPHS**

**E1 – WETLANDS**



## PHOTOGRAPHIC RECORD Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 1**

**Date:**

May 18, 2011

**Description:**

Wetland Pr-w01

PEM



**Photo No. 2**

**Date:**

May 18, 2011

**Description:**

Wetland Pr-w02

PEM





## PHOTOGRAPHIC RECORD Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 3**

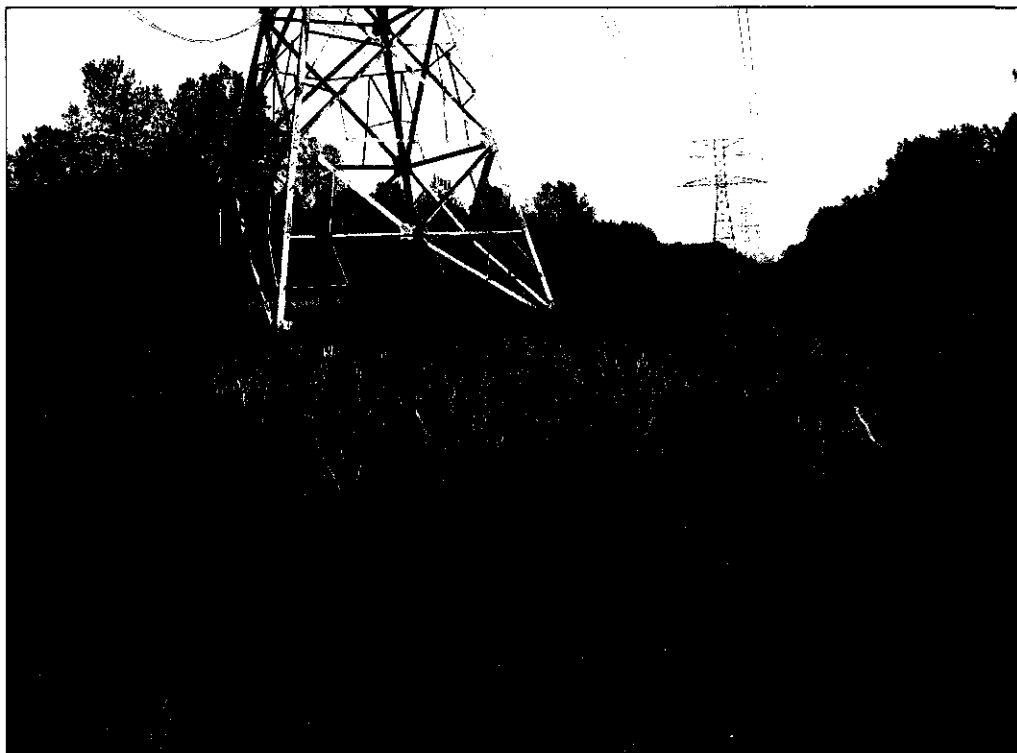
**Date:**

May 18, 2011

**Description:**

Wetland Pr-w03

PEM



**Photo No. 4**

**Date:**

May 18, 2011

**Description:**

Wetland Pr-w04a

PFO





**PHOTOGRAPHIC RECORD**  
**Wetlands**

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 5**

**Date:**

May 18, 2011

**Description:**

Wetland Pr-w04b

PEM



**Photo No. 6**

**Date:**

May 18, 2011

**Description:**

Wetland Pr-w05

PEM

(no photo available)





## PHOTOGRAPHIC RECORD

### Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 7**

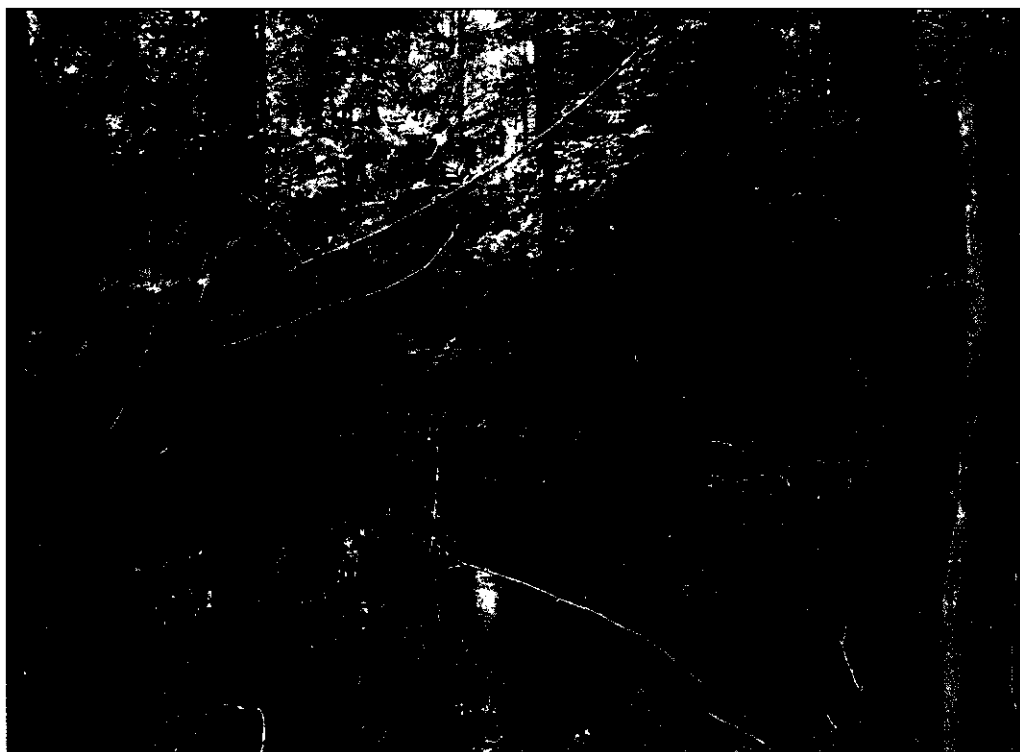
**Date:**

May 18, 2011

**Description:**

Wetland Pr-w06a

PFO



**Photo No. 8**

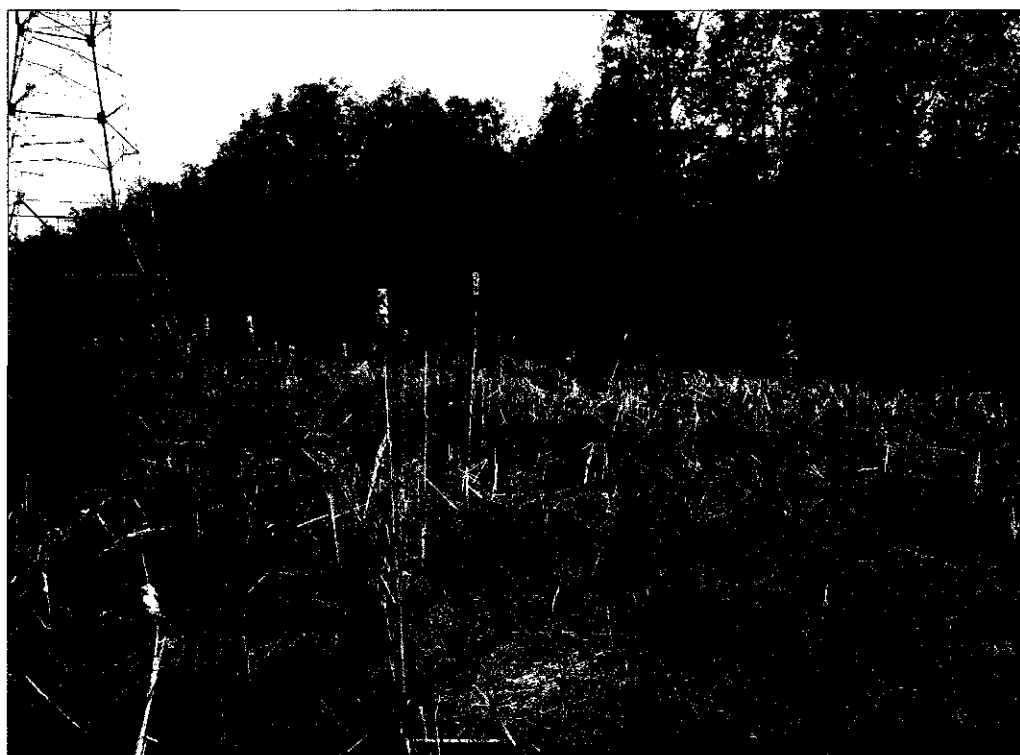
**Date:**

May 18, 2011

**Description:**

Wetland Pr-w06b

PEM





## PHOTOGRAPHIC RECORD Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 9**

**Date:**

August 31, 2011

**Description:**

Wetland Pr-w07

PEM/PSS



**Photo No. 10**

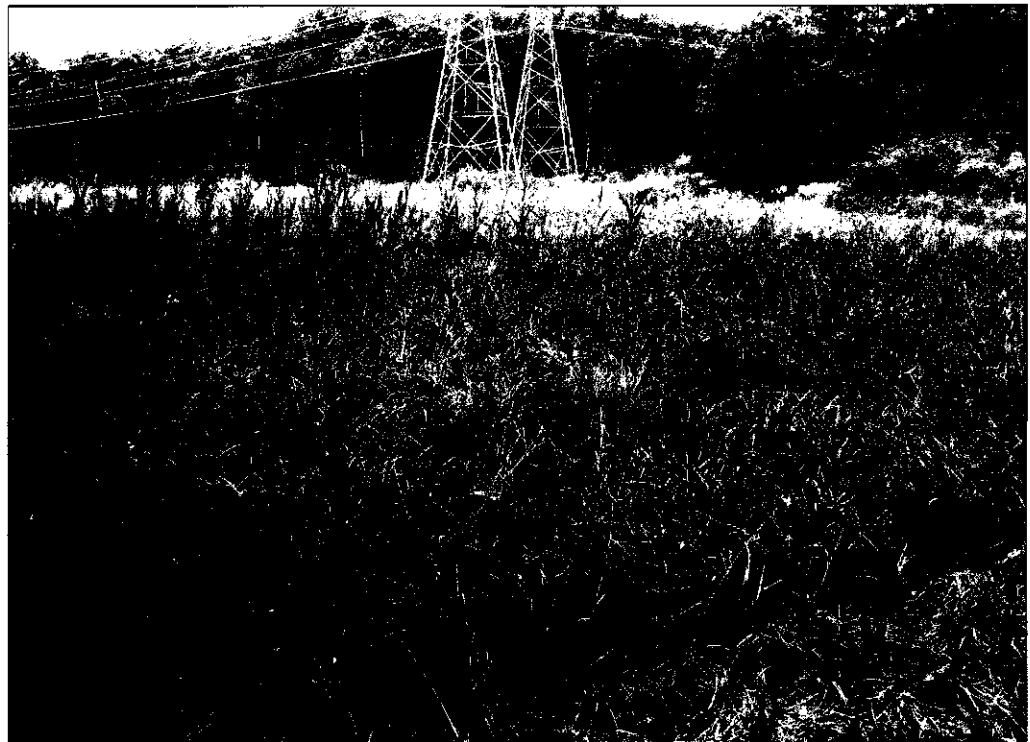
**Date:**

August 31, 2011

**Description:**

Wetland Pr-w08

PEM






## PHOTOGRAPHIC RECORD Wetlands

<b>Client Name:</b> FirstEnergy	<b>Site Location:</b> Beaver-Davis Besse New Construction (Preferred Route)	<b>Project No.</b> 14950065
------------------------------------	--	--------------------------------

<b>Photo No. 11</b>	
<b>Date:</b> September 15, 2011	
<b>Description:</b> Wetland Pr-w09 PFO/PEM	

<b>Photo No. 12</b>	
<b>Date:</b> September 15, 2011	
<b>Description:</b> Wetland Pr-w10 PEM	



## PHOTOGRAPHIC RECORD

### Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 13**

**Date:**

September 15, 2011

**Description:**

Wetland Pr-w11

PEM



**Photo No. 14**

**Date:**

September 15, 2011

**Description:**

Wetland Pr-w12

PEM





## PHOTOGRAPHIC RECORD Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 15**

**Date:**

August 30, 2011

**Description:**

Wetland Pr-w13a

PEM



**Photo No. 16**

**Date:**

August 30, 2011

**Description:**

Wetland Pr-w13b

PFO





## PHOTOGRAPHIC RECORD Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 17**

**Date:**

August 30, 2011

**Description:**

Wetland Pr-w13c

PEM/PSS



**Photo No. 18**

**Date:**

August 30, 2011

**Description:**

Wetland Pr-w14

PEM





## PHOTOGRAPHIC RECORD

### Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 19****Date:**

May 19, 2011

**Description:**

Wetland Pr-w15

PFO/PSS

**Photo No. 20****Date:**

May 19, 2011

**Description:**

Wetland Pr-w16

PEM






## PHOTOGRAPHIC RECORD

### Wetlands

<b>Client Name:</b> FirstEnergy	<b>Site Location:</b> Beaver-Davis Besse New Construction (Preferred Route)	<b>Project No.</b> 14950065
------------------------------------	--	--------------------------------

<b>Photo No. 21</b>	
<b>Date:</b> May 19, 2011	
<b>Description:</b> Wetland Pr-w17 PEM	

<b>Photo No. 22</b>	
<b>Date:</b> May 19, 2011	
<b>Description:</b> Wetland Pr-w18 PEM	





## PHOTOGRAPHIC RECORD

### Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 23**

**Date:**

May 20, 2011

**Description:**

Wetland Pr-w19

PEM



**Photo No. 24**

**Date:**

May 20, 2011

**Description:**

Wetland Pr-w20

PEM





## PHOTOGRAPHIC RECORD Wetlands

**Client Name:**  
FirstEnergy

**Site Location:**  
Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**  
14950065

**Photo No. 25**

**Date:**

May 20, 2011

**Description:**

Wetland Pr-w21

POW/PEM/PSS



**Photo No. 26**

**Date:**

May 20, 2011

**Description:**

Wetland Pr-w22

PEM





## PHOTOGRAPHIC RECORD

### Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 27**

**Date:**

May 20, 2011

**Description:**

Wetland Pr-w23

PSS/PEM/PFO



**Photo No. 28**

**Date:**

May 20, 2011

**Description:**

Wetland Pr-w24

PSS/PFO/PEM





## PHOTOGRAPHIC RECORD Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 29**

**Date:**

May 20, 2011

**Description:**

Wetland Pr-w25

PEM



**Photo No. 30**

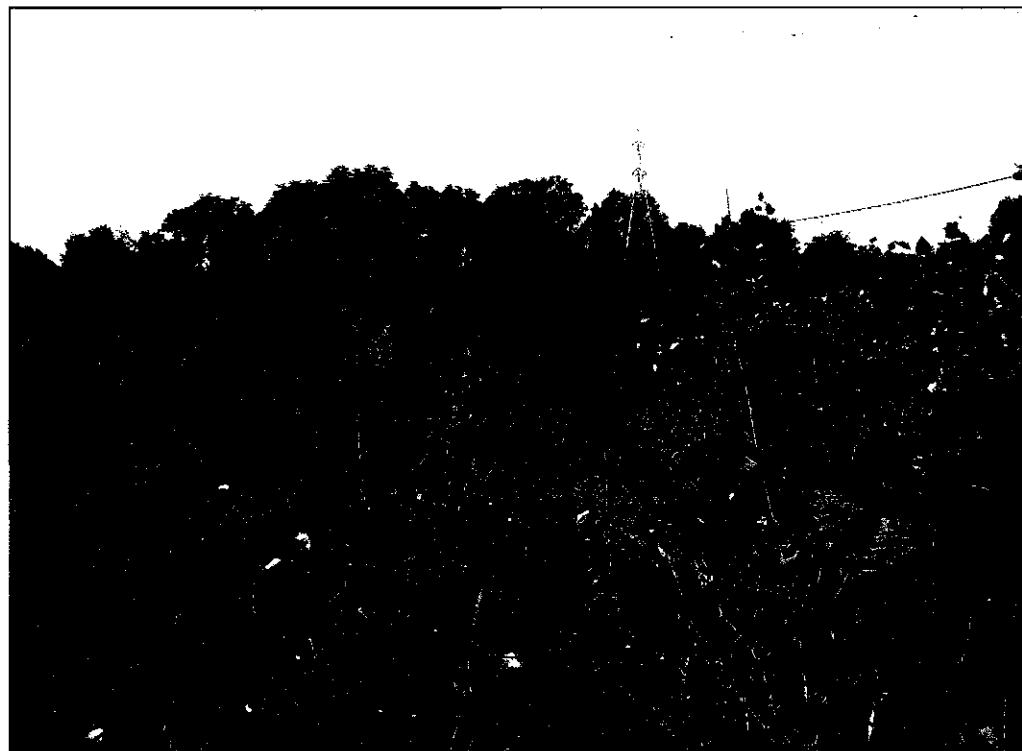
**Date:**

August 30, 2011

**Description:**

Wetland Pr-w26

PEM/PSS





## PHOTOGRAPHIC RECORD

### Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 31**

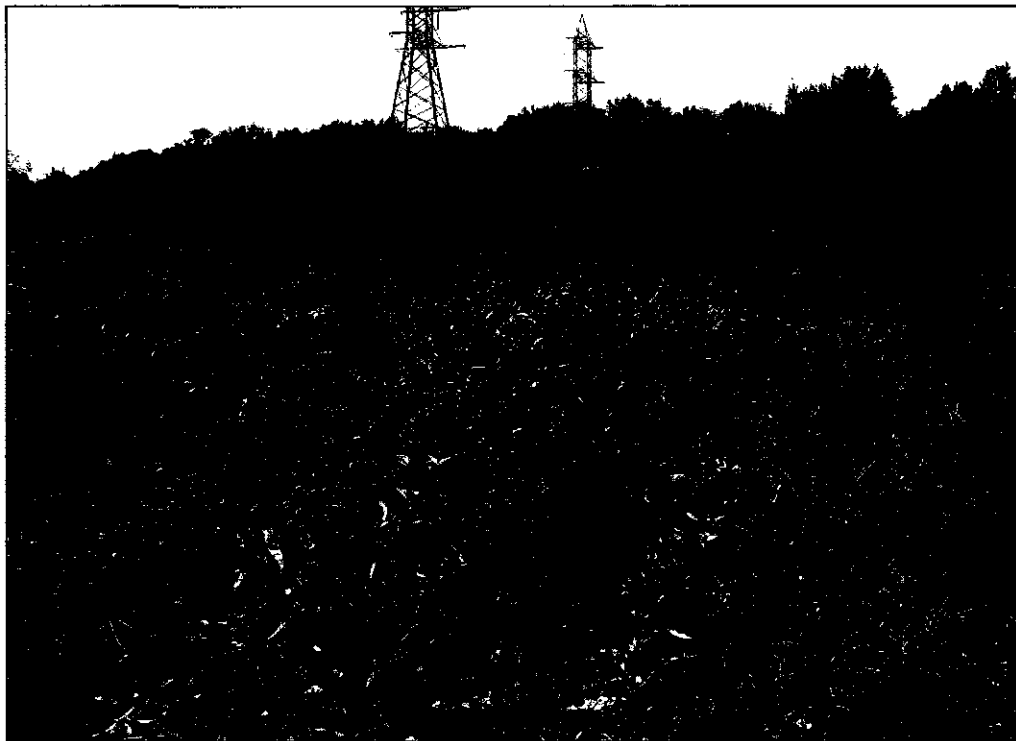
**Date:**

August 30, 2011

**Description:**

Wetland Pr-w27

PEM



**Photo No. 32**

**Date:**

August 30, 2011

**Description:**

Wetland Pr-w28

PEM/PSS



## **E2 – QHEI STREAMS**



## PHOTOGRAPHIC RECORD QHEI Streams

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**

14950065

**Photo No. 1**

**Date:**

August 31, 2011

**Description:**

Pr-s01b

Quarry Creek

Facing Downstream



**Photo No. 2**

**Date:**

August 30, 2011

**Description:**

Pr-s01c

Quarry Creek

Facing Upstream




**E3 – HHEI STREAMS**





## PHOTOGRAPHIC RECORD HHEI Streams

<b>Client Name:</b> FirstEnergy	<b>Site Location:</b> Beaver-Davis Besse New Construction (Preferred Route)	<b>Project No.</b> 14950065
------------------------------------	--	--------------------------------

<b>Photo No. 1</b>	
<b>Date:</b> May 19, 2011	
<b>Description:</b> Pr-s02 Ephemeral Stream Facing Downstream	

**E4 – PONDS**



## PHOTOGRAPHIC RECORD

### Ponds

**Client Name:**  
FirstEnergy

**Site Location:**  
Beaver-Davis Besse New Construction (Preferred Route)

**Project No.**  
14950065

**Photo No. 1**

**Date:**  
May 20, 2011

**Description:**  
Pr-p01  
Facing south



**Photo No. 2**

**Date:**  
August 30, 2011

**Description:**  
Pr-p02  
Facing southeast



**BEAVER-BROWNHELM JUNCTION 345 kV  
NEW CONSTRUCTION-ALTERNATE  
ROUTE  
TRANSMISSION LINE PROJECT**

**WETLAND DELINEATION AND STREAM ASSESSMENT  
REPORT**

*Prepared for:*  
American Transmission Systems, Incorporated  
a subsidiary of  
FirstEnergy Corp  
76 South Main Street  
Akron, Ohio 44308

**ATSI**

**URS**

525 Vine Street, Suite 1800  
Cincinnati, Ohio 45202

July 2012

**TABLE OF CONTENTS**

1.0	INTRODUCTION .....	1
2.0	METHODOLOGY .....	1
2.1	WETLAND DELINEATION .....	2
2.1.1	SOILS .....	2
2.1.2	HYDROLOGY .....	3
2.1.3	VEGETATION .....	4
2.1.4	WETLAND CLASSIFICATIONS .....	4
2.1.5	OHIO RAPID ASSESSMENT METHOD V 5.0 .....	5
2.2	STREAM & RIVER CROSSINGS .....	6
2.2.1	OHIO EPA QUALITATIVE HABITAT EVALUATION INDEX .....	6
2.2.2	OHIO EPA PRIMARY HEADWATER HABITAT EVALUATION INDEX .....	7
3.0	RESULTS .....	8
3.1	WETLAND DELINEATION .....	8
3.1.1	Preliminary Soils Evaluation .....	8
3.1.2	National Wetland Inventory Map Review .....	9
3.1.3	Delineated Wetlands .....	9
3.1.4	Delineated Wetlands ORAM V 5.0 Results .....	10
3.2	STREAM & RIVER CROSSINGS .....	11
3.2.1	Qualitative Habitat Evaluation Index .....	11
3.2.2	Primary Headwater Habitat Evaluation Index .....	12
3.3	PONDS .....	13
4.0	SUMMARY .....	13
5.0	REFERENCES .....	15

**TABLES****Number**

Table 1	Beaver-Brownhelm Junction 345 kV Alternate Route Transmission Line Project Soil Map Units and Descriptions
Table 2	NWI Wetlands within the Beaver-Brownhelm Junction 345kV Alternate Route Transmission Line Project Ecology Survey Corridor
Table 3	Vegetation Identified within URS Delineated Wetlands
Table 4	Delineated Wetlands within the Beaver-Brownhelm Junction 345kV Alternate Route Transmission Line Project Ecology Survey Corridor
Table 5	Streams Identified within the Beaver-Brownhelm Junction 345kV Alternate Route Transmission Line Project Ecology Survey Corridor
Table 6	Ponds Identified within the Beaver-Brownhelm Junction 345kV Alternate Route Transmission Line Project Ecology Survey Corridor

**FIGURES****Number**

1	Alternate Route Project Overview Map
2	Alternate Route National Wetland Inventory Map
3A through 3D	Alternate Route Wetland Delineation Maps
4A through 4D	Alternate Route Soils Map

**APPENDICES****Appendix**

A	U.S. Army Corps of Engineers Wetland Forms
B	Ohio EPA Wetland ORAM Forms
C	Ohio EPA QHEI Stream Forms
D	Ohio EPA HHEI Stream Forms
E	Delineated Features Photographs
E1	Wetlands
E2	QHEI Streams
E3	HHEI Streams
E4	Ponds

**LIST OF ACRONYMS**

ATSI	American Transmission Systems, Incorporated
EPA	Environmental Protection Agency
FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
GPS	Global Positioning System
HHEI	Headwater Habitat Evaluation Index
HUC	Hydrologic unit code
NRCS	National Resource Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate wetland
OHWM	Ordinary high water mark
ORAM	Ohio Rapid Assessment Method
PEM	Palustrine emergent
PHWH	Primary Headwater Habitat
PSS	Palustrine scrub/shrub
QHEI	Qualitative Habitat Evaluation Index
ROW	Right-of-way
UPL	Upland
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

## **1.0 INTRODUCTION**

American Transmission Systems, Incorporated (“ATSI”), a subsidiary of FirstEnergy Corp., is proposing to construct approximately 2.8 miles of new 345 kV transmission line from the Beaver Substation to an existing FirstEnergy transmission line. The new transmission line will be built with a combination of wood and steel pole construction taking place in the existing right-of-way. The majority of the new construction will be for the Beaver-Carlisle 345 kV Transmission Line; although immediately adjacent to the Beaver Substation it will be used for the Avon-Beaver #1 345 kV Transmission Line. Several of the last 345 kV transmission line spans connected to the Beaver substation will be swung over one bay to avoid line crossings. The Project is referred to as the Beaver to Brownhelm Junction 345 kV New Construction Transmission Line Project (Preferred Route). The proposed Project is illustrated on Figure 1.

To the extent practical, ATSI has taken advantage of existing electric transmission line corridors during the planning and routing of the proposed Project. As a result, the entire proposed Project route will closely parallel an existing electric transmission line.

Land uses crossed by the Project survey corridor were assigned a general classification based upon the principal land characteristics of the location as observed from within a given area, aerial photograph review, and field surveys. Three general land use types will be crossed by the proposed Project (wetlands, open land (hay fields, fallow fields), and existing rights-of-way). The dominant land uses within the Project area are existing rights-of-way and open land.

## **2.0 METHODOLOGY**

The purpose of the field survey was to assess whether wetlands and other “waters of the U.S.” exist within the Alternate Route survey corridor. Prior to conducting field surveys, digital and published county Natural Resources Conservation Service (NRCS) soil surveys, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, and U.S. Geological Survey (USGS) 7.5-minute topographic maps were reviewed as an exercise to identify the occurrence and location of potential wetland areas. In May, August, and September 2011 and April 2012, URS biologists walked the Project study corridor to conduct a waterbody and wetland delineation. The study corridor was determined by buffering the centerline of the proposed transmission line by 100-feet on each side, totaling a 200-foot-wide study corridor.

During field surveys, the physical boundaries of observed water features were recorded using sub-meter accurate Trimble Global Positioning System (GPS) units. The GPS data were then reviewed and edited for errors.



The field survey results presented herein apply to the existing and reasonably foreseeable site conditions at the time of our assessment. They cannot apply to site changes of which URS is unaware and has not had the opportunity to review. Changes in the condition of a property may occur with time due to natural processes or human impacts at the project site or on adjacent properties. Changes in applicable standards may also occur as a result of legislation or the expansion of knowledge over time. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond the control of URS.

## **2.1 WETLAND DELINEATION**

The Project survey corridor was evaluated according to the procedures outlined in the *U.S. Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual (1987 Manual) (Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) (Regional Supplement) (USACE, 2012)*. This Regional Supplement was released in January 2012 by the USACE to address specific regional wetland characteristics and improve the accuracy and efficiency of wetland delineation procedures. The 1987 Manual and Regional Supplement define wetlands as areas that have positive evidence of three environmental parameters: hydric soils, wetland hydrology, and hydrophytic vegetation. Wetland boundaries are placed where one or more of these parameters give way to upland characteristics.

Since quantitative data were not available for any of the identified wetlands, URS utilized the routine delineation method described in the 1987 Manual and Regional Supplement that consisted of a pedestrian site reconnaissance, including identifying the vegetation communities, soils identification, a geomorphologic assessment of hydrology, and notation of disturbance. Completed USACE wetland delineation forms recorded for the Project are provided in Appendix A.

### **2.1.1 SOILS**

Soils were examined using a hand auger to extract soil cores. These cores were examined for hydric soil characteristics. A *Munsell Soil Color Chart* (Kollmorgen Corporation, 1988) was used to identify the hue, value, and chroma of the matrix and redoximorphic features (mottles) of the soils. Generally, mottled soils with a matrix chroma of two or less, or unmottled soils with a matrix chroma of one or less are considered to exhibit hydric soil characteristics (Environmental Laboratory, 1987). In sandy soils, mottled soils with a matrix chroma of three or less, or unmottled soils with a matrix chroma of two or less are considered to be hydric soils.

A total of 28 soil map units from 22 soil series are mapped within the limits of the Project survey boundary (USDA 2011). Table 1 provides a list of these soil map units along with their basic attributes.

According the *Web Soil Survey* (USDA, 2011) and the Natural Resources Conservation Services: Hydric Soils List of Ohio, 10 soil map units from nine soil series within the Project survey boundary are listed as hydric or containing a hydric component.

### **2.1.2 HYDROLOGY**

The *1987 Manual* requires that an area be inundated or saturated to the surface for an absolute minimum of five percent of the growing season (areas saturated between five percent and 12.5 percent of the growing season may or may not be wetlands, while areas saturated over 12.5 percent of the growing season fulfill the hydrology requirements for wetlands). The *Regional Supplement* states that the growing season dates are determined through onsite observations of the following indicators of biological activity in a given year: (1) above-ground growth and development of vascular plants, and/or (2) soil temperature (12-in. depth) is 41 degrees Fahrenheit (°F) or higher, as an indicator of soil microbial activity. Therefore, the beginning of the growing season in a given year is indicated by whichever condition occurs earlier, and the end of the growing season by whichever persists later.

The *Regional Supplement* also states that if onsite data gathering is not practical, the growing season can be approximated by the number of days between the average (five years out of ten, or 50 percent probability) date of the last and first 28°F air temperature in the spring and fall, respectively. The National Weather Service Wetland Evaluation Technical System (WETS) data obtained from the NRCS National Water and Climate Center for Lorain County, Ohio reveals that in an average year, this period begins between April 16, and lasts until November 2, or 201 days. In the Project area, five percent of the growing season equates to approximately 10 days (USDA, 2012).

The soils and ground surface were examined for evidence of wetland hydrology in lieu of detailed hydrological data. This is an acceptable approach according to the *1987 Manual* and the *Regional Supplement*. Evidence indicating wetland hydrology typically includes primary indicators such as surface water, saturation, water marks, drift deposits, water-stained leaves, sediment deposits and oxidized rhizospheres on living roots; and secondary indicators such as, drainage patterns, geomorphic position, micro-topographic relief, and a positive Facultative (FAC)-neutral test (USACE, 2010).

A review of USGS watershed data indicates that the Project is located within the Black-Rocky Watershed of the Southern Lake Erie Subregion (USGS, 2011). Within this watershed, the project will cross one minor watershed: Lake Erie Tributaries East of Vermilion River and West of Black River.

### **2.1.3 VEGETATION**

Dominant vegetation was visually assessed for each stratum (tree, sapling/shrub, herb and woody vine) and an indicator status of obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and/or upland (UPL) was assigned to each plant species based on the *1988 National List of Plant Species that Occur in Wetlands: Region 1* (Region 1 includes the state of Ohio). An area is determined to have hydrophytic vegetation when, under normal circumstances, 50 percent or more of the composition of the dominant species are OBL, FACW and/or FAC species. Vegetation of an area was determined to be non-hydrophytic when more than 50 percent of the composition of the dominant species was comprised of FACU and/or UPL species. In addition to the dominance test, the FAC-Neutral test and prevalence tests are used to determine if a wetland has a predominance of hydrophytic vegetation. Table 3 lists the vegetation that was identified in delineated wetlands during field surveys.

### **2.1.4 WETLAND CLASSIFICATIONS**

Wetlands were classified based on the naming convention found in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin *et al*, 1979). All identified wetlands within the survey corridor were classified as freshwater, Palustrine Systems, which includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens. Three Palustrine wetland classes were identified in the project area. The three classes are as follows:

- **PEM** – Emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.
- **PSS** – Scrub/shrub wetlands are characterized by woody vegetation that is less than 3 inches diameter at breast height (DBH), and greater than 3.28 feet tall. The woody angiosperms (i.e. small trees or shrubs) in this broad leaved deciduous community have relatively wide, flat leaves that are shed annually during the cold or dry season.
- **PFO** – Forested wetlands are characterized by woody vegetation that is 3 inches or more DBH, regardless of height. The woody angiosperms (i.e. flowering trees or shrubs) in this broad leaved deciduous community have relatively wide, flat leaves that are shed annually during the cold or dry season.

### **2.1.5 OHIO RAPID ASSESSMENT METHOD V 5.0**

The Ohio Environmental Protection Agency (Ohio EPA) Ohio Rapid Assessment Method for Wetlands v. 5.0 (ORAM) was developed to determine the relative ecological quality and level of disturbance of a particular wetland in order to meet requirements under Section 401 of the Clean Water Act. Wetlands are scored on the basis of hydrology, upland buffer, habitat alteration, special wetland communities, and vegetation communities. Each of these subject areas is further divided into subcategories under ORAM v5.0 resulting in a score that describes the wetland using a range from 0 (low quality and high disturbance) to 100 (high quality and low disturbance). Wetlands scored from 0 to 29.9 are grouped into "Category 1", 30 to 59.9 are "Category 2" and 60 to 100 are "Category 3". Transitional zones exist between "Categories 1 and 2" from 30 to 34.9 and between "Categories 2 and 3" from 60 to 64.9. However, according to the Ohio EPA, if the wetland score falls into the transitional range, it must be given the higher Category unless scientific data can prove it should be in a lower Category (Mack, 2001). The ORAM scores for the wetlands that were delineated are discussed in Section 3.1.4 of this report.

#### ***Category 1 Wetlands***

Category 1 wetlands support minimal wildlife habitat, hydrological and recreational functions, and do not provide for or contain critical habitats for threatened or endangered species. In addition, Category 1 wetlands are often hydrologically isolated and have some or all of the following characteristics: low species diversity, no significant habitat or wildlife use, limited potential to achieve wetland functions, and/or a predominance of non-native species. These limited quality wetlands are considered to be a resource that has been severely degraded or has a limited potential for restoration, or is of low ecological functionality.

#### ***Category 2 Wetlands***

Category 2 wetlands "...support moderate wildlife habitat, or hydrological or recreational functions," and as wetlands which are "...dominated by native species but generally without the presence of, or habitat for, rare, threatened or endangered species; and wetlands which are degraded but have a reasonable potential for reestablishing lost wetland functions." Category 2 wetlands constitute the broad middle category of "good" quality wetlands, and can be considered a functioning, diverse, healthy water resource that has ecological integrity and human value. Some Category 2 wetlands are lacking in human disturbance and considered to be naturally of moderate quality; others may have been Category 3 wetlands in the past, but have been degraded to Category 2 status.

### ***Category 3 Wetlands***

Wetlands that are assigned to Category 3 have “...superior habitat, or superior hydrological or recreational functions.” They are typified by generally high levels of diversity, a high proportion of native species, and/or high functional values. Category 3 wetlands include wetlands which contain or provide habitat for threatened or endangered species, are high quality mature forested wetlands, vernal pools, bogs, fens, or which are scarce regionally and/or statewide. It is important to stress that a wetland may be a Category 3 wetland because it exhibits one or all of the above characteristics. For example, a forested wetland located in the flood plain of a river may exhibit “superior” hydrologic functions (e.g. flood retention, nutrient removal), but not contain mature trees or high levels of plant species diversity.

## **2.2 STREAM & RIVER CROSSINGS**

Regulatory activities under the Clean Water Act provide authority for states to issue water quality standards and “designated uses” to all waters of the U.S. upstream to the highest reaches of the tributary streams. In addition, the Federal Water Pollution Control Act of 1972 and its 1977 and 1987 amendments require knowledge of the potential fish or biological communities that can be supported in a stream or river, including upstream headwaters. Streams were identified by the presence of a defined bed and bank, and/or evidence of an ordinary high water mark (OHWM).

Stream assessments were conducted using the methods described in the Ohio EPA’s Methods for Assessing Habitat in Flowing Waters: Using Ohio EPA’s *Qualitative Habitat Evaluation Index* (Rankin, 2006) and *Field Evaluation Manual for Ohio’s Primary Headwater Habitat Streams, version 1* (Davic, 2002).

### **2.2.1 OHIO EPA QUALITATIVE HABITAT EVALUATION INDEX**

The qualitative habitat evaluation index (QHEI) is designed to provide a rapid determination of habitat features that correspond to those physical factors that most affect fish communities and are generally important to other aquatic life (e.g., macroinvertebrates). The quantitative measure of habitat used to calibrate the QHEI score are Indices (or an Index) of Biotic Integrity (IBI) for fish. In most instances the QHEI is sufficient to give an indication of habitat quality, and the intensive qualitative analysis used to measure the IBI is not necessary. It is the IBI, rather than the QHEI, that is directly correlated with the aquatic life use designation for a particular surface water.

The QHEI method is generally considered appropriate for waterbodies with drainage basins greater than one square mile, if natural pools are greater than 40 cm, or if the water feature is

shown as blue-line waterways on USGS 7.5-minute topographic quadrangle maps. In order to convey general stream habitat quality to the regulated public, the Ohio EPA has assigned narrative ratings to QHEI scores. The ranges vary slightly for headwater streams (H are those with a watershed area less than or equal to 20 square miles) versus larger streams (L are those with a watershed area greater than 20 square miles). The Narrative Rating System includes: Very Poor (<30 H and L), Poor (30 to 42 H, 30 to 44 L), Fair (43 to 54 H, 45 to 59 L), Good (55 to 69 H, 60 to 74 L) and Excellent (70+ H, 75+ L). Results of the QHEI assessments are discussed in Section 3.2.1 of this report.

### **2.2.2 OHIO EPA PRIMARY HEADWATER HABITAT EVALUATION INDEX**

Headwater streams are typically considered to be first-order and second-order streams, meaning streams that have no upstream tributaries (or “branches”) and those that have only first-order tributaries, respectively. The stream order concept can be problematic when used to define headwater streams because stream-order designations vary depending upon the accuracy and resolution of the stream delineation. Headwater streams are generally not shown on USGS 7.5-minute topographic quadrangles and are sometimes difficult to distinguish on aerial photographs. Nevertheless, headwater streams are now recognized as useful monitoring units due to their abundance, widespread spatial scale and landscape position (Fritz, et al. 2006). Impacts to headwater streams can have a cascading effect on the downstream water quality and habitat value. The headwater habitat evaluation index (HHEI) is a rapid field assessment method for physical habitat that can be used to appraise the biological potential of most Primary Headwater Habitat (PHWH) streams. The HHEI was developed using many of the same techniques as used for QHEI, but has criteria specifically designed for headwater habitats. To use HHEI, the stream must have a “defined bed and bank, with either continuous or periodically flowing water, watershed area less than or equal to 1.0 mi<sup>2</sup> (259 ha), and a maximum depth of water pools equal to or less than 15.75 inches (40 cm)” (Davic, 2002).

Headwater streams are scored on the basis of channel substrate composition, bankfull width, and maximum pool depth. Assessments result in a score (0 to 100) that is converted to a specific PHWH stream class. Streams that are scored from 0 to 29.9 are typically grouped into “Class 1 PHWH Streams”, 30 to 69.9 are “Class 2 PHWH Streams”, and 70 to 100 are “Class 3 PHWH Streams”. Technically, a stream can score relatively high, but actually belong in a lower class, and vice-versa. According to the Ohio EPA, if the stream score falls into a class and the scorer feels that based on site observations that score does not reflect the actual stream class, a decision-making flow chart can be used to determine appropriate PHWH stream class using the HHEI protocol (Davic, 2002). Evidence of anthropogenic alterations to the natural channel will result

in a "Modified" qualifier for the stream. Results of HHEI assessed streams are discussed in Section 3.2.2 of this report.

***Class 1 PWHH Streams:*** Class 1 PWHH Streams are those that have "normally dry channels with little or no aquatic life present" (Davic, 2002). These waterways are usually ephemeral, with water present for short periods of time due to infiltration from snowmelts or rainwater runoff.

***Class 2 PWHH Streams:*** Class 2 PWHH Streams are equivalent to "warm-water habitat" streams. This stream class has a "moderately diverse community of warm-water adapted native fauna either present seasonally or on an annual basis" (Davic, 2002). These species communities are composed of vertebrates (fish and salamanders) and/or benthic macroinvertebrates that are considered pioneering, headwater temporary, and/or temperature facultative species.

***Class 3 PWHH Streams:*** Class 3 PWHH Streams usually have perennial water flow with cool-cold water adapted native fauna. The community of Class 3 PWHH Streams is comprised of vertebrates (either cold water adapted species of headwater fish and or obligate aquatic species of salamanders, with larval stages present), and/or a diverse community of benthic cool water adapted macroinvertebrates present in the stream continuously (on an annual basis).

Results of the HHEI assessments are discussed in Section 3.2.2 of this report.

## **3.0 RESULTS**

Within the 200-foot study corridor, URS delineated 12 wetlands, seven streams (one stream, Quarry Creek, was crossed four times, and was evaluated at three different locations), and one pond. These wetlands and other water features are discussed in detail in the following sections.

### **3.1 WETLAND DELINEATION**

The locations, approximate extents, and acreages of the wetlands identified within the Project 200-foot survey corridor are shown on Figures 3A through 3D. Completed USACE routine wetland delineation forms are provided in Appendix A. Color photographs were taken of each delineated wetland during the field survey and are provided in Appendix E1.

#### **3.1.1 Preliminary Soils Evaluation**

According to the *Web Soil Survey* for Lorain County, Ohio (USDA, 2011) and the Natural Resources Conservation Services Hydric Soils List of Ohio, 28 soil units from 22 soil series are mapped within the 200-foot survey corridor, and include nine soil series with hydric soil map units (USDA, 2011). Soils in each wetland were observed and documented as part of the

delineation methodology. Soil series located within the project area are shown on Figure 4A through 4D. Table 1 provides a detailed overview of all soil series within the 200-foot survey corridor.

### **3.1.2 National Wetland Inventory Map Review**

National Wetland Inventory (NWI) wetlands are areas of potential wetland that have been identified from USFWS aerial photograph interpretation which have typically not been field verified. Forested and heavy scrub/shrub wetlands are often not shown on NWI maps as foliage effectively hides the visual signature that indicates the presence of standing water and moist soils from an aerial view. As a result, NWI maps do not show all the wetlands found in a particular area nor do they necessarily provide accurate wetland boundaries. NWI maps are useful for providing indications of potential wetland areas, which are often supported by soil mapping and hydrologic predictions, based upon topographical analysis using USGS topographic maps.

According to the NWI map of the East Vermilion, Ohio quadrangle, the Alternate Route corridor contained two mapped NWI wetlands, including one Palustrine Forested wetland and one Palustrine Unconsolidated Bottom wetland. The mapped Palustrine Unconsolidated Bottom wetland was shown covering the majority of pond Pr-p02. The other mapped Palustrine Forested NWI wetland was not crossed by any of the field-delineated wetlands. Summary information on NWI mapped wetlands is presented in Table 2.

### **3.1.3 Delineated Wetlands**

The delineation identified 12 wetlands, totaling 2.91-acres, within the 200-foot survey corridor (Table 4). Do note that some wetland boundaries extend beyond the 200-foot survey corridor, but only the portion that was within the study corridor was assessed. These wetlands are of four different wetland habitat types: six are palustrine emergent (PEM) wetlands, four are palustrine emergent-scrub/shrub (PEM/PSS) wetlands, one is a mixed palustrine forested-emergent (PFO/PEM) wetland, and one is a mixed palustrine forested-scrub/shrub (PFO/PSS) wetland.

The locations, approximate extents, and acreages of the wetlands identified within the Project 200-foot survey corridor are shown on Figures 3A through 3D. Completed USACE wetland delineation forms are provided in Appendix A. Color photographs were taken of each delineated wetland during the field survey and are provided in Appendix E1.



**TABLE 3.1.3**  
**SUMMARY OF DELINEATED WETLANDS WITHIN THE**  
**ALTERNATE ROUTE SURVEY CORRIDOR**

<b>Cowardin Wetland Type</b>	<b>Number of Wetlands</b>	<b>Category 1</b>	<b>Category 2</b>	<b>Category 3</b>	<b>Acreage within Survey Corridor</b>	<b>Linear Feet Crossed by Centerline<sup>a</sup></b>
PEM	6	4	2	0	0.55	119
PEM/PSS	4	3	1	0	2.10	465
PFO/PEM	1	0	1	0	0.07	NC
PFO/PSS	1	0	1	0	0.19	186
<b>Alternate Route Total</b>	<b>12</b>	<b>7</b>	<b>5</b>	<b>0</b>	<b>2.91</b>	<b>769</b>

Linear Feet Crossed by Centerline (feet)<sup>a</sup>: NC = Not Crossed by proposed centerline

### 3.1.4 Delineated Wetlands ORAM V 5.0 Results

Within the Project 200-foot survey corridor, seven of the 12 wetlands are Category 1 wetlands and the remaining six wetlands are Category 2 wetlands. No Category 3 wetlands were delineated during the field investigations. Wetland Pr-w28 had the lowest ORAM score, 22, and Wetland Alt-05b had the highest score, 39. Completed ORAM forms for the individual wetlands are provided in Appendix B.

#### *Category 1 Wetlands*

The seven Category 1 wetlands delineated within the 200-foot survey corridor include four PEM wetlands and three PEM/PSS wetlands. The highest scoring Category 1 wetland was 29 (Alt-w04a and Alt-w06), and the lowest was 22 (Pr-w28). These wetlands typically exhibited narrow upland buffers and intensive use of adjacent upland areas (row cropping, open pasture, residential, or construction), exhibited limited plant community development with a moderate to high percentage of invasive species, and characteristically had habitat and hydrology in the early stages of recovering from previous manipulation because of farming or other disturbances.

### ***Category 2 Wetlands***

The five Category 2 wetlands delineated within the 200-foot survey corridor include: two PEM wetlands, one PFO/PEM wetland, one PEM/PSS wetland, and one PFO/PSS wetland. The highest scoring Category 2 wetland was 39 (Wetland Alt-w05b), and the lowest was 30 (Alt-w02). Category 2 wetlands with dominant forested and mixed emergent, scrub/shrub, forested plant communities were identified within the survey corridor. Category 2 wetlands generally exhibited moderate to high quality plant communities with few invasive species, moderate to good plant community interspersions, low to high intensity surrounding land use (e.g. young second growth woodlots, shrub-land, etc.), and recovered and/or no modification to natural hydrology and habitat.

### ***Category 3 Wetlands***

No Category 3 wetlands were evaluated during the field investigations.

## **3.2 STREAM & RIVER CROSSINGS**

Streams within the 200-foot survey corridor are provided in Table 5. The locations of streams identified within the 200-foot survey corridor are shown on Figures 3A through 3D.

Within the 200-foot survey corridor, seven streams totaling 3,025 linear feet were assessed; four ephemeral (683 linear feet), two intermittent (505 linear feet) and one perennial (four crossings; 1,837 linear feet) waterbodies. The perennial waterbody was assessed in three of the four crossings based on variation of substrate and surrounding area. Six streams were assessed using the HHEI methodology (drainage area less than 1 mi<sup>2</sup>). The remaining stream was assessed using the QHEI methodology (drainage area greater than 1 mi<sup>2</sup>).

URS has preliminarily determined that all assessed streams within the survey corridor appear to be jurisdictional (i.e., waters of the U.S.), as they all appear to be tributaries that flow into or combine with other streams.

### **3.2.1 Qualitative Habitat Evaluation Index**

The QHEI assessed stream totaling 1,837 linear feet (Quarry Creek, three individual assessments) within the 200-foot survey corridor received a narrative rating of “good warmwater habitat stream” in all three of the locations that were evaluated, with scores of 56.5, 58, and 60.5. The substrates of the stream were generally dominated by gravel, silt, and bedrock, with lesser amounts of boulder/slabs, hardpan and muck. Areas of the stream showed evidence of undercut

banks, overhanging vegetation, rootwads, shallows in slow water, and little to moderate erosion. Pool depths did not exceed 18 inches, and bankfull width generally did not exceed 25 feet. Forms for the streams assessed using the QHEI methodology are provided in Appendix C. Color photographs were taken of each sampled location of the stream during the field survey and are provided in Appendix E2.

***Very Poor Warmwater Habitat Streams*** –No very poor warmwater habitat streams were evaluated during the field investigations.

***Poor Warmwater Habitat Streams*** – No poor warmwater habitat streams were evaluated during the field investigations.

***Fair Warmwater Habitat Streams*** – No fair warmwater habitat streams were evaluated during the field investigations.

***Good Warmwater Habitat Streams***- One good warmwater habitat stream (Quarry Creek) (Pr-s01a, Pr-s01b, and Pr-s01c) was evaluated in three separate locations of the stream and is discussed above.

### **3.2.2 Primary Headwater Habitat Evaluation Index**

Field surveys along the proposed Alternate Route identified six primary headwater streams: three Class 1 streams, two Modified Class 1 streams, and one Class 2 stream. Completed HHEI forms are provided in Appendix D. Color photographs were taken of each stream during the field survey and are provided in Appendix E3.

***Modified Class 1 Headwater Streams*** - Two Modified Class 1 headwater streams totaling 461 linear feet were identified during the field investigations with scores of 11 and 13. One of the streams was ephemeral, and the other was intermittent. The dominant substrates consisted of clay, hardpan, leaf pack/woody debris, and silt, with lesser amounts of bedrock, cobble, gravel, and boulders. The streams contained evidence of manmade stream channel modifications (e.g. channelization, culverting, etc.). These modifications result in these streams receiving a Modified Class 1 designation. Both of the streams were dry at the time of the field investigations, and the bank full width did not exceed three feet.

***Class 1 Headwater Streams*** – Three Class 1 headwater streams totaling 462 linear feet were identified during field surveys, with scores ranging from 11 to 19. All three of the streams were ephemeral, and the dominant substrates generally consisted of clay, hardpan, gravel, and leaf pack/woody debris, with lesser amounts of bedrock and cobble. All three of the streams were dry at the time of the field investigations, and the bank full width did not exceed two feet.

***Modified Class 2 Headwater Streams*** - No Modified Class 2 headwater streams were evaluated during the field investigations.

***Class 2 Headwater Streams*** – One Class 2 headwater stream totaling 266 linear feet was identified during the field investigation, and received a score of 51. The stream was intermittent, and the dominant substrates were bedrock and gravel, with lesser amounts of boulder, cobble, leaf pack/woody debris, and clay/hardpan. The stream displayed a wide riparian zone, which consisted of a mature woodlot. The maximum pool depth was approximately three inches, and the bank full width was approximately 3 feet.

***Modified Class 3 Headwater Streams*** - No Modified Class 3 headwater streams were evaluated during the field investigations.

***Class 3 Headwater Streams*** – No Class 3 headwater streams were evaluated during the field investigations.

### **3.3 PONDS**

One pond was assessed along the Project (Table 6). The acreage of the pond within the 200-foot survey corridor was 0.28 acre. The pond appeared to be man-made for livestock or recreational use. The location of the pond is shown on Figure 3D. A color photograph was taken of the pond during the field survey and is provided in Appendix E4.

## **4.0 SUMMARY**

During the field survey, a total of 12 wetlands, seven streams (with 10 total crossings), and one pond were identified within the 200-foot survey corridor. The 12 wetlands totaled 2.91 acres within the survey area. These wetlands are of five different wetland habitat types: six are palustrine emergent (PEM) wetlands, four are palustrine emergent-scrub/shrub (PEM/PSS) wetlands, one is a mixed palustrine forested-emergent (PFO/PEM) wetland, and one is a mixed palustrine forested-scrub/shrub (PFO/PSS) wetland.

Within the Project survey corridor, seven of the 12 wetlands are Category 1 wetlands and the remaining five wetlands are Category 2 wetlands. No Category 3 wetlands were delineated within the 200-foot survey corridor.

Within the Project survey corridor, seven streams totaling 3,025 linear feet were assessed; four ephemeral (683 linear feet), two intermittent (505 linear feet) and one perennial (four crossings; 1,837 linear feet) waterbodies. The perennial waterbody was assessed in three separate locations

based on variation of substrate and surrounding area. Six streams were assessed using the HHEI methodology (drainage area less than 1 mi<sup>2</sup>). The remaining stream was assessed using the QHEI methodology (drainage area greater than 1 mi<sup>2</sup>). The HHEI streams received scores ranging from 11 to 51. Three of the HHEI streams were classified as Class 1 Headwater Streams, two were classified as Modified Class 1 Headwater Streams, and one was classified as a Class 2 Headwater Stream. The remaining stream was assessed in three locations (four crossings) using the QHEI methodology (drainage area greater than 1 mi<sup>2</sup>). The stream received scores of 56.5, 58, and 60.5, and was classified as a Good Warmwater Habitat Stream in all locations.

One man-made pond, totaling 0.28-acre, was also assessed along the Project survey corridor.

## **5.0 REFERENCES**

- Cowardin, L.M., V. Carter, F.C. Golet and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Office of Biological Services, U.S. Fish and Wildlife Service, Washington, D.C.
- Davic, Robert D. 2002. *Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams. Final Version 1.0*. Ohio Environmental Protection Agency, Division of Surface Water, Columbus, Ohio.
- Environmental Laboratory. 1987. U.S. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station: Vicksburg, Mississippi.
- Fritz, K.M., Johnson, B.R., and Walters, D.M. 2006. Field Operations Manual for Assessing the Hydrologic Permanence and Ecological Condition of Headwater Streams. EPA/600/ R-06/126. U.S. Environmental Protection Agency, Office of Research and Development, Washington DC.
- Kollmorgen Corporation. 1988. Munsell Soil Color Charts. Baltimore, Maryland.
- Mack, John J. 2001. *Ohio Rapid Assessment Method for Wetlands v. 5.0, User's Manual and Scoring Forms. Ohio EPA Technical Report WET/2001-1*. Ohio Environmental Protection Agency, Division of Surface Water, 401/Wetland Ecology Unit, Columbus, Ohio.
- Rankin, Edward T. 2006. *Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI)*. Ohio EPA Ecological Assessment Section, Division of Surface Water, Columbus, Ohio.
- U.S. Army Corps of Engineers. 2009. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-09-19. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 1970. Soil Survey of Lorain County, Ohio. 99 p.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 2011. National Hydric Soils List. <http://soils.usda.gov/use/hydric/> Accessed 11/15/11
- U.S. Fish and Wildlife Service. 1983. *National Wetlands Inventory Map*. Vermilion East, Ohio quadrangle.

TABLE 1  
BEAVER-BROWNHELM 345 KV ALTERNATE ROUTE TRANSMISSION LINE PROJECT SOIL MAP UNITS AND DESCRIPTIONS

Soil Series	Symbol	Map Unit Description	Percent of Route by Series	County	Topographic Setting	Hydric	Hydric Component (%)
Allis	AlA	Allis silty clay loam, 0 to 2 percent slopes	7.95	Lorain	Depressions	Inclusions	Areas with thin layer of glacial till over shale bedrock (3)
	B1A	Bogart loam, 0 to 2 percent slopes	0.38	Lorain	Lake plains and along major streams	no	n/a
Bogart	B1B	Bogart loam, 2 to 6 percent slopes	0.78	Lorain	Adjacent to drainageways and on beach ridges	no	n/a
Chili	C1B	Chili loam, 2 to 6 percent slopes	1.21	Lorain	Elongated areas	no	n/a
	CoB	Conotton gravelly loam, 2 to 6 percent slopes	1.44	Lorain	Areas near sandstone highs	no	n/a
Conotton	CoC	Conotton gravelly loam, 6 to 12 percent slopes	2.21	Lorain	Areas near sandstone highs	no	n/a
Udorthents	Cz	Udorthents	1.78	Lorain	Areas where earth, trash, and slag have been dumped	no	n/a
Dekalb	DkB	Dekalb very clayey loam, 1 to 6 percent slopes	0.79	Lorain	Flat, rounded tops of sandstone highs	no	n/a
Elsworth	E1D2	Elsworth silt loam, 12 to 18 percent slopes, moderately eroded	2.11	Lorain	Areas along major drainageways	no	n/a
	F1A	Fulton silt loam, 0 to 2 percent slopes	20.08	Lorain	Areas that parallel the shore of Lake Erie	no	n/a
	HsA	Haskins loam, 0 to 2 percent slopes	14.54	Lorain	Depressions	Inclusions	Merrill (3)
Haskins	HsB	Haskins loam, 2 to 6 percent slopes	0.03	Lorain	Remnants of beach ridges and along drainageways	no	n/a
	Hy	Holly silt loam	3.35	Lorain	Flood plains	Yes	Holly (95)
Hornell	H2A	Hornell silt loam, 0 to 2 percent slopes	1.28	Lorain	Depressions	Inclusions	Miner (4), Allis (4)
	H2B	Hornell silt loam, 2 to 6 percent slopes	3.44	Lorain	Depressions	Inclusions	Miner (5), Allis (5)
	JsA	Jintown sandy loam, 0 to 2 percent slopes	2.81	Lorain	Beach ridges, outwash plains, stream terraces	no	n/a
Jintown	J1A	Jintown loam, 0 to 2 percent slopes	0.19	Lorain	Beach ridges, outwash plains, stream terraces	no	n/a
	LoB	Lockport silty clay loam, 1 to 4 percent slopes	2.73	Lorain	Near sandstone highs	no	n/a
Lorain	L1A	Lorain silty clay loam	0.02	Lorain	Depressions	Yes	Lorain (90), other areas (10)
Merrill	M1o	Merrill loam	5.81	Lorain	Depressions	Yes	Merrill (90), Lorain (4), areas with silt loam (2)
Miner	M1r	Miner silty clay loam	3.65	Lorain	Depressions	Yes	Miner (85), Luray (3), Lorain (3), Trumbull (3), other areas (3)
Mitiwanga	M1A	Mitiwanga silt loam, 0 to 2 percent slopes	4.76	Lorain	Flat and rounded tops at the base of sandstone highs	no	n/a

**ATSI**

Table 1  
Page 1 of 2

Beaver-Brownhelm Junction 345KV  
Transmission Line Project  
Alternate Route

**TABLE 1**  
**BEAVER-BROWNHELM 345 kV ALTERNATE ROUTE TRANSMISSION LINE PROJECT SOIL MAP UNITS AND DESCRIPTIONS**

Soil Series	Symbol	Map Unit Description	Percent of Route by Series	County	Topographic Setting	Hydric	Hydric Component (%)
	MB	Miltwanga silt loam, 2 to 6 percent slopes	2.72	Lorain	Rounded tops and at the base of sandstone highs	no	n/a
Olsted	Om	Olsted fine sandy loam	6.56	Lorain	Depressions	Yes	Olsted (92), Mermill (5), areas with silty clay loam (3)
Orville	Or	Orville silt loam	3.62	Lorain	Drainageways	Inclusions	Holly (5)
Oshlomo	OB	Oshlomo sandy loam, 2 to 6 percent slopes	0.92	Lorain	Drainageways	no	n/a
Rawson	RdA	Rawson loam, 0 to 2 percent slopes	2.44	Lorain	Low knolls on the lake plain and along streams	no	n/a
Tyner	TyC	Tyner loamy sand, 6 to 12 percent slopes	2.41	Lorain	Sandy beach ridges	no	n/a

**NOTES:**

(1) Percentages do not add up to exactly 100% due to rounding

(2) Data sources include:

USDA, NRCS 2011 Soil Survey Geographic (SSURGO) Database. Available online at: <http://soildatamart.nrcs.usda.gov/>USDA, NRCS October 2011, National Hydric Soils List by State. Available online at: <http://soils.usda.gov/hse/hydro/hislist/state.html>

USDA, NRCS 1976, Soil Survey of Lorain County, Ohio.



TABLE 2

**NWI WETLANDS WITHIN THE BEAVER-BROWNHELM JUNCTION 345 kV  
ALTERNATE ROUTE TRANSMISSION LINE PROJECT SURVEY CORRIDOR**

<b>Wetland Type</b>	<b>NWI Code</b>	<b>NWI Habitat Type<sup>1</sup></b>	<b>Total # of Each Habitat Type</b>	<b>NWI Quadrangle(s)</b>
Freshwater Forested/Shrub Wetland	PFO1C	Palustrine Forested Broad-Leaved Deciduous Seasonally Flooded	1	Vermilion East
Freshwater Pond	PUBG	Palustrine Unconsolidated Bottom Intermittently Exposed	1	Vermilion East
<b>Total Number NWI Wetlands = 2</b>				

<sup>1</sup> USFWS National Wetlands Inventory Classification De-coder: <http://137.227.242.85/Data/interpreters/wetlands.aspx>

TABLE 3  
VEGETATION IDENTIFIED WITHIN DELINEATED WETLANDS

Common Name	Scientific Name	Stratum <sup>a</sup>	Region 1 Indicator Status <sup>b</sup>
Allegheny blackberry	<i>Rubus allegheniensis</i>	H	FACU
American elm	<i>Ulmus americana</i>	T	FACW
Arrowleaf tearthumb	<i>Polygonum sagittatum</i>	H	OBL
Arrowwood viburnum	<i>Viburnum dentatum</i>	S	FAC
Autumn Olive	<i>Elaeagnus umbellata</i>	S	NI
Big Bluestem	<i>Andropogon gerardii</i>	H	FAC
Black mustard	<i>Brassica nigra</i>	H	NI
Black willow	<i>Salix nigra</i>	S & T	FACW
Bright red top	<i>Agrostis gigantea</i>	H	FACW
Broad-leaf cattail	<i>Typha latifolia</i>	H	OBL
Buttonbush	<i>Cephalanthus occidentalis</i>	S	OBL
Sedge	<i>Carex</i> sp.	H	FAC
Cockspur hawthorn	<i>Crataegus crus-galli</i>	S	FACU
Common boneset	<i>Eupatorium perfoliatum</i>	H	FACW
Common reed	<i>Phragmites australis</i>	H	FACW
Deertongue	<i>Dichanthelium clandestinum</i>	H	FAC
Eastern cottonwood	<i>Populus deltoides</i>	S & T	FAC
Field horsetail	<i>Equisetum arvense</i>	H	FAC
Fuller's teasel	<i>Dipsacus fullonum</i>	H	NI
Glossy buckthorn	<i>Frangula alnus</i>	S	FAC
Green ash	<i>Fraxinus pennsylvanica</i>	S & T	FACW
Indian hemp	<i>Apocynum cannabinum</i>	H	FACU
Japanese stiltgrass	<i>Microstegium vimineum</i>	H	NI

TABLE 3  
VEGETATION IDENTIFIED WITHIN DELINEATED WETLANDS

Common Name	Scientific Name	Stratum <sup>a</sup>	Region 1 Indicator Status <sup>b</sup>
Jewelweed	<i>Impatiens capensis</i>	H	FACW
Narrow-leaf cattail	<i>Typha angustifolia</i>	H	OBL
Nodding beggarick	<i>Bidens cernua</i>	H	OBL
Pennsylvania smartweed	<i>Polygonum pennsylvanicum</i>	H	FACW
Peppermint	<i>Mentha piperita</i>	H	FACW
Pin oak	<i>Quercus palustris</i>	S & T	FACW
Poison ivy	<i>Toxicodendron radicans</i>	S	FAC
Purple loosestrife	<i>Lythrum salicaria</i>	H	FACW
Red maple	<i>Acer rubrum</i>	S & T	FAC
Redosier dogwood	<i>Cornus sericea</i>	S	FACW
Reed canary grass	<i>Phalaris arundinacea</i>	H	FACW
Riverbank grape	<i>Vitis riparia</i>	V	FACW
Round-leaf goldenrod	<i>Solidago patula</i>	H	OBL
Rufous bulrush	<i>Scirpus pendulus</i>	H	OBL
Rush	<i>Juncus</i> sp.	H	FAC
Sandbar willow	<i>Salix interior</i>	S	OBL
Sensitive fern	<i>Onoclea sensibilis</i>	H	FACW
Small-flowered agrimony	<i>Agrimonia parviflora</i>	H	FAC
Soft rush	<i>Juncus effusus</i>	H	FACW
Swamp milkweed	<i>Asclepias incarnata</i>	H	OBL
Turtle head	<i>Chelone glabra</i>	H	OBL
Virginia creeper	<i>Parthenocissus quinquefolia</i>	H	FACU
Woolgrass	<i>Scirpus cyperinus</i>	H	FACW

TABLE 3  
VEGETATION IDENTIFIED WITHIN DELINEATED WETLANDS

Common Name	Scientific Name	Stratum <sup>a</sup>	Region 1 Indicator Status <sup>b</sup>
-------------	-----------------	----------------------	--

<sup>a</sup> H = herb, S = shrub or sapling, T = tree, V = vine

<sup>b</sup> Wetland Indicator Status  
OBL - Obligate Wetland - Occurs almost always (99% probability) in wetlands  
FACW - Facultative Wetlands - Usually occurs in wetlands (67 - 99% probability)  
FAC - Facultative - Equally likely to occur in wetlands or non-wetlands (34 - 66% probability)  
FACU - Facultative Upland - Usually occurs in non-wetlands (67 - 99% probability)  
UPL - Obligate Upland - Occurs almost always in non-wetlands (99% probability)

TABLE 4

**DELINEATED WETLANDS WITHIN THE BEAVER-BROWNHELM JUNCTION 345 kV  
ALTERNATE ROUTE TRANSMISSION LINE PROJECT ECOLOGY SURVEY CORRIDOR<sup>1</sup>**

Report Name	Cowardin Wetland Type <sup>a</sup>	ORAM Score	ORAM Category	Acres within 200 Foot Corridor	Approximate Length Crossed by Centerline (feet)
Pr-w01	PEM	26	1	0.10	27
Pr-w02	PEM	24	1	0.02	NC
Pr-w03	PEM	25	1	0.24	65
Alt-w01	PEM	31	2	0.08	NC
Alt-w02	PEM	30	2	0.11	13
Alt-w03	PEM/PSS	31	2	0.08	21
Alt-w04b	PEM/PSS	27	1	0.50	4
Alt-w04a	PEM/PSS	29	1	1.26	440
Alt-w05b	PFO/PEM	39	2	0.07	NC
Alt-w05a	PFO/PSS	36	2	0.19	186
Alt-w06	PEM	29	1	0.01	14
Pr-w28	PEM/PSS	22	1	0.26	NC
<b>TOTAL</b>	<b>12</b>			<b>2.91</b>	<b>770</b>

<sup>1</sup> Streams are listed from the northern end of the project to the southern end of the project (as shown on Figures 3A through 3D).

Cowardin Wetland Type<sup>a</sup>: PEM – palustrine emergent, PSS – palustrine scrub/shrub, PFO – palustrine forested.

Linear Feet Crossed by Centerline (feet)<sup>b</sup>: NC = Not Crossed by proposed centerline

**TABLE 5**  
**STREAMS IDENTIFIED WITHIN THE BEAVER-BROWNHelm JUNCTION 345 kV**  
**ALTERNATE ROUTE TRANSMISSION LINE PROJECT SURVEY CORRIDOR<sup>1</sup>**

Stream Name	Waterbody Name	Flow Type	Estimated Width of Stream Crossing (feet)	Maximum Pool Depth (inches)	Approximate Length Within 200 Foot Survey Corridor (feet)	Assessment Used	Score	Narrative Description
Pr-s01a	Quarry Creek	Perennial	25	4	325	QHEI	60.5	Good Warmwater
Pr-s01b	Quarry Creek	Perennial	15	4	798	QHEI	58	Good Warmwater
Alt-s01a	Tributary to Quarry Creek	Intermittent	1	0	239	HHEI	11	Modified Class I
Alt-s01b	Tributary to Quarry Creek	Intermittent	3	3	266	HHEI	51	Class II
Alt-s02	Tributary to Quarry Creek	Ephemeral	2	0	204	HHEI	19	Class I
Alt-s03	Tributary to Quarry Creek	Ephemeral	3	0	222	HHEI	13	Modified Class I
Alt-s04	Tributary to Quarry Creek	Ephemeral	2	0	215	HHEI	12	Class I
Alt-s05	Tributary to Quarry Creek	Ephemeral	1	0	43	HHEI	11	Class I
Pr-s01c (northern crossing)	Quarry Creek	Perennial	3.5	18	345	QHEI	56.5	Good Warmwater
Pr-s01c (southern crossing)	Quarry Creek	Perennial	3.5	18	368	QHEI	56.5	Good Warmwater
<b>Total</b>					<b>3,025</b>			

<sup>1</sup> Streams are listed from the northern end of the project to the southern end of the project (as shown on Figures 3A through 3D).

**TABLE 6****POND IDENTIFIED WITHIN THE BEAVER-BROWNHelm JUNCTION  
345 kV ALTERNATE ROUTE TRANSMISSION LINE PROJECT ECOLOGY SURVEY CORRIDOR**

<b>Pond Name</b>	<b>County</b>	<b>Acreage within Survey Corridor</b>	<b>Approximate Length Crossed by Centerline (feet)</b>
Pr-p02	Lorain	0.28	71
<b>Total</b>		<b>0.28</b>	<b>71</b>

# Locator Map



Lake Erie

Beaver

LORAIN

VERMILION

Amherst

AMHERST

Brownhelm Junction

South Amherst

SOUTH AMHERST

J:\GIS\Projects\First Energy\Beaver Davis\Besse/BDB NC Overview\_Alt.mxd

## LEGEND:

- Beaver Substation
- Alternate Route Centerline
- - - Existing FirstEnergy Transmission Line
- City Boundary

0 1 2

Scale In Miles

BASE MAP SOURCE:  
ArcGIS Map Service  
<http://goto.arcgisonline.com/maps>  
World Street Map

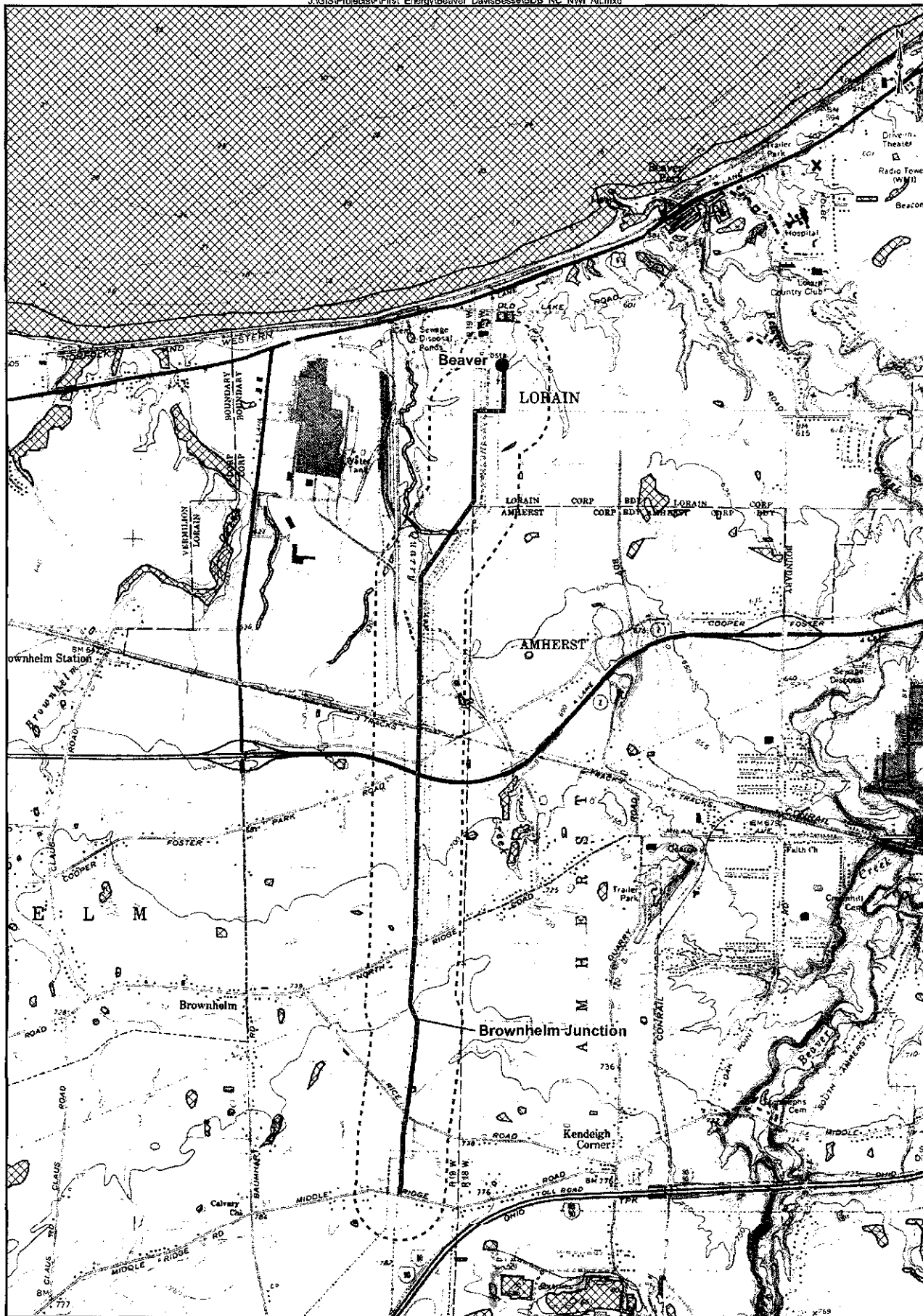
**ATSI** Beaver-Brownhelm Junction  
345kV Transmission Line

FIGURE 1  
ALTERNATE ROUTE  
PROJECT VICINITY MAP

JOB NO. 14950065

**URS**





**LEGEND:**

- Beaver Substation
- Alternate Route Centerline
- - - Alternate Route 2,000 Foot Corridor
- ▨ National Wetland Inventory

0 2,000 4,000

Scale In Feet

BASE MAP SOURCE:  
USGS 7.5-minute Topographic Quadrangle-  
Vermilion East

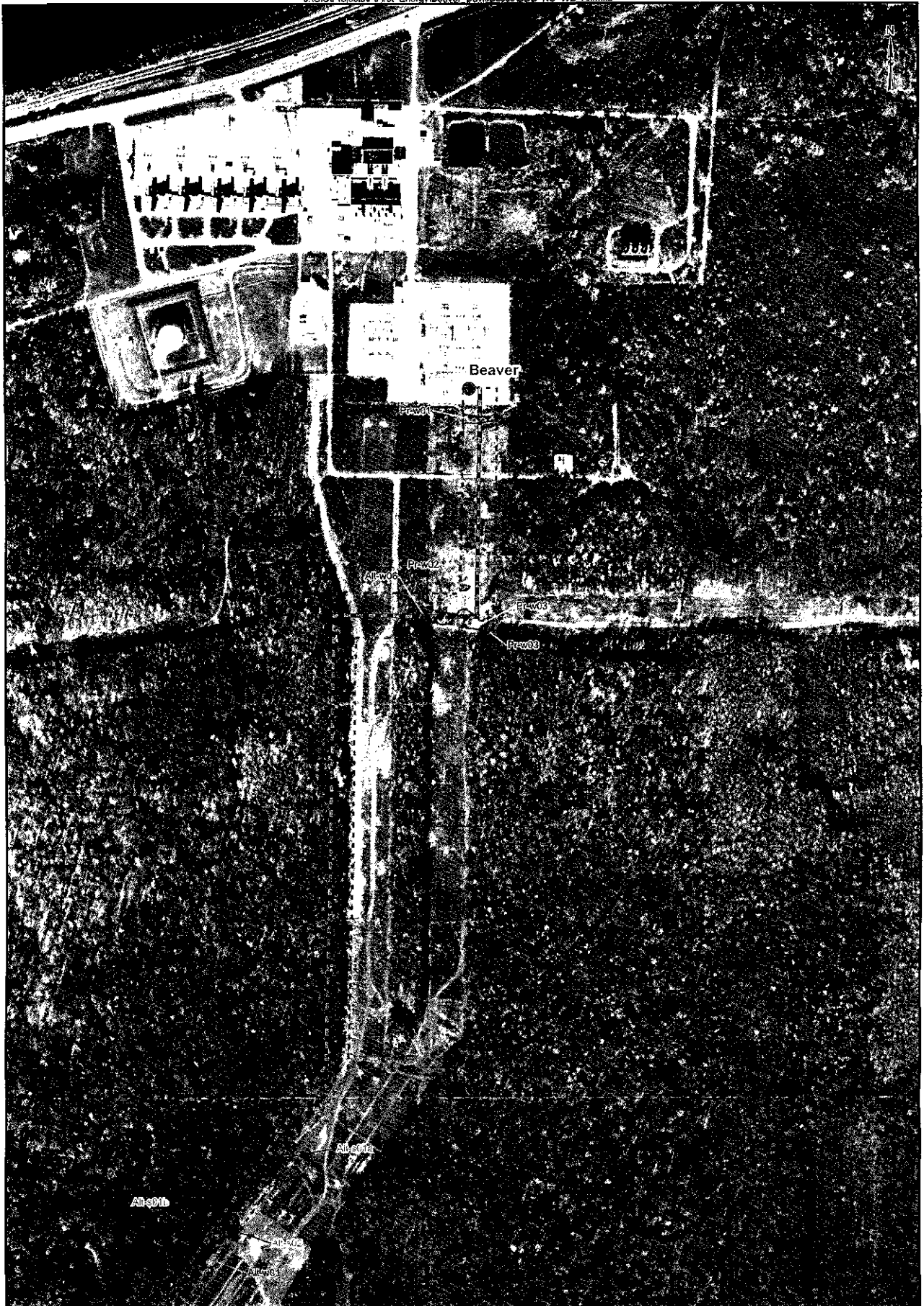
\*National Wetland Inventory Source-  
<http://107.20.228.18/Wetlands/WetlandsMapper.html>

**ATSI** Beaver-Brownhelm Junction  
345kV Transmission Line

**FIGURE 2**  
**ALTERNATE ROUTE**  
**NATIONAL WETLAND**  
**INVENTORY MAP**

JOB NO. 14950065

**URS**



**LEGEND:**

- |                            |                        |
|----------------------------|------------------------|
| Beaver Substation          | QHEI Delineated Stream |
| Alternate Route Centerline | Delineated Pond        |
| Ecological Survey Corridor | Delineated Wetland     |
| HHEI Delineated Stream     |                        |

0 400 800

Scale In Feet

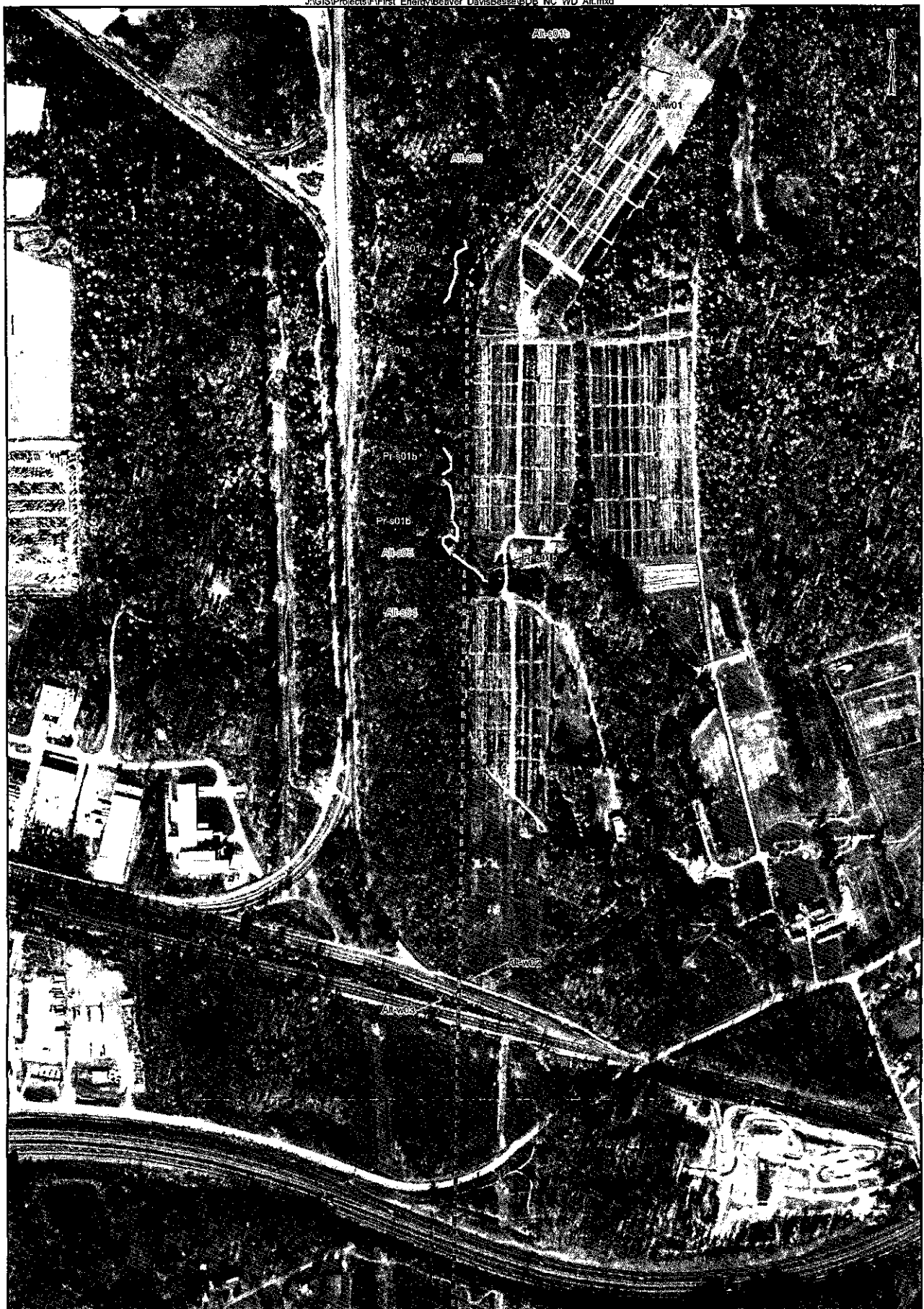
BASE MAP SOURCE:  
AroGIS Map Service  
Aerials Express  
Cleveland, 2009

**ATSI** Beaver-Brownhelm Junction  
345kV Transmission Line

**FIGURE 3A**  
ALTERNATE ROUTE  
WETLAND DELINEATION AND  
STREAM ASSESSMENT MAP

JOB NO. 14950065

**URS**



**LEGEND:**

- Beaver Substation
- Alternate Route Centerline
- Ecological Survey Corridor
- HHEI Delineated Stream
- QHEI Delineated Stream
- Delineated Pond
- Delineated Wetland

0 400 800

Scale In Feet

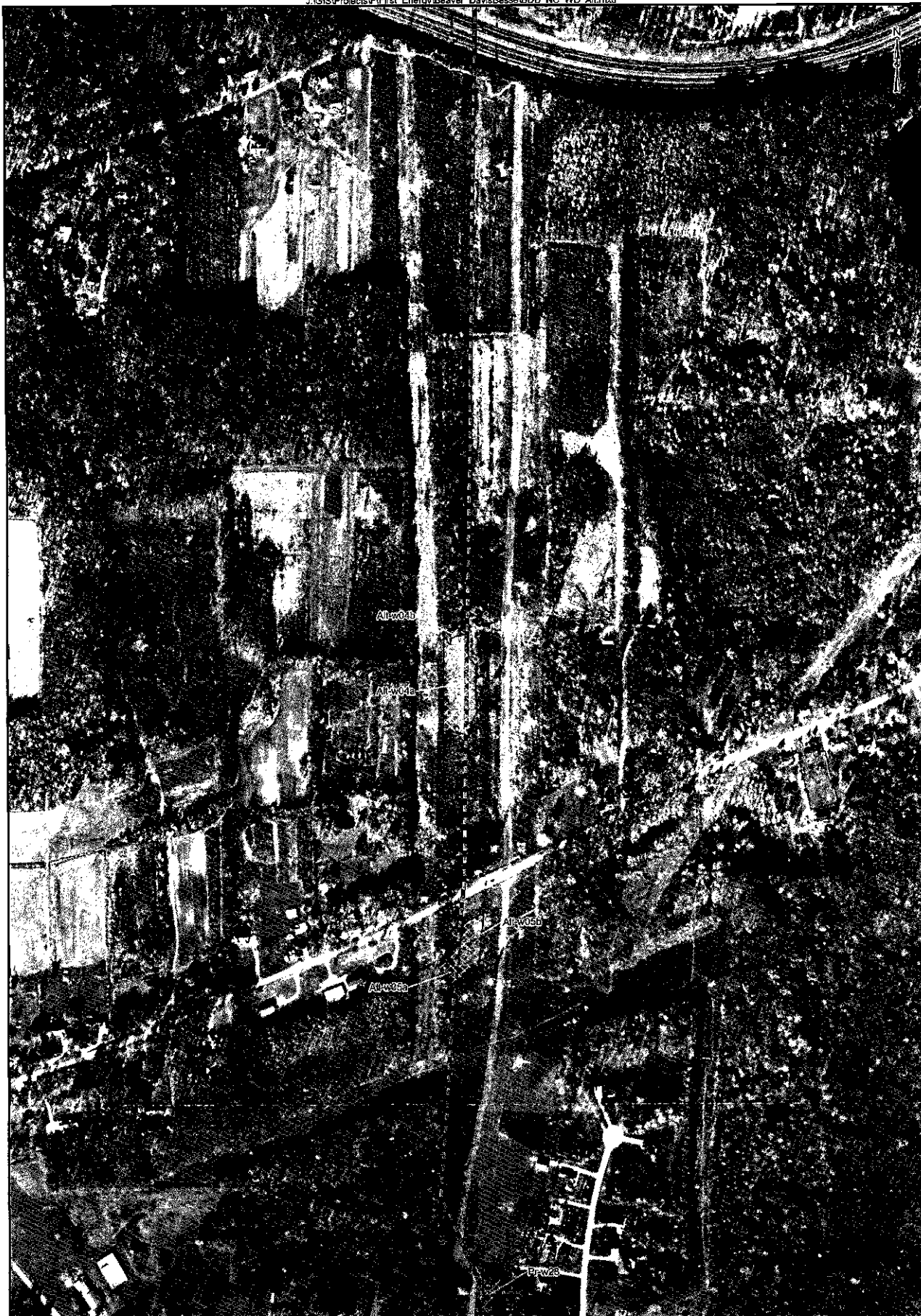
BASE MAP SOURCE:  
ArcGIS Map Service  
Aerials Express  
Cleveland, 2009

**ATSI** Beaver-Brownhelm Junction  
345kV Transmission Line

**FIGURE 3B**  
**ALTERNATE ROUTE**  
**WETLAND DELINEATION AND**  
**STREAM ASSESSMENT MAP**

JOB NO. 14950055

**URS**



**LEGEND:**

- Beaver Substation
- Alternate Route Centerline
- Ecological Survey Corridor
- HHEI Delineated Stream
- QHEI Delineated Stream
- Delineated Pond
- Delineated Wetland

0 400 800

Scale in Feet

BASE MAP SOURCE:  
ArcGIS Map Service  
Aerials Express  
Cleveland, 2009

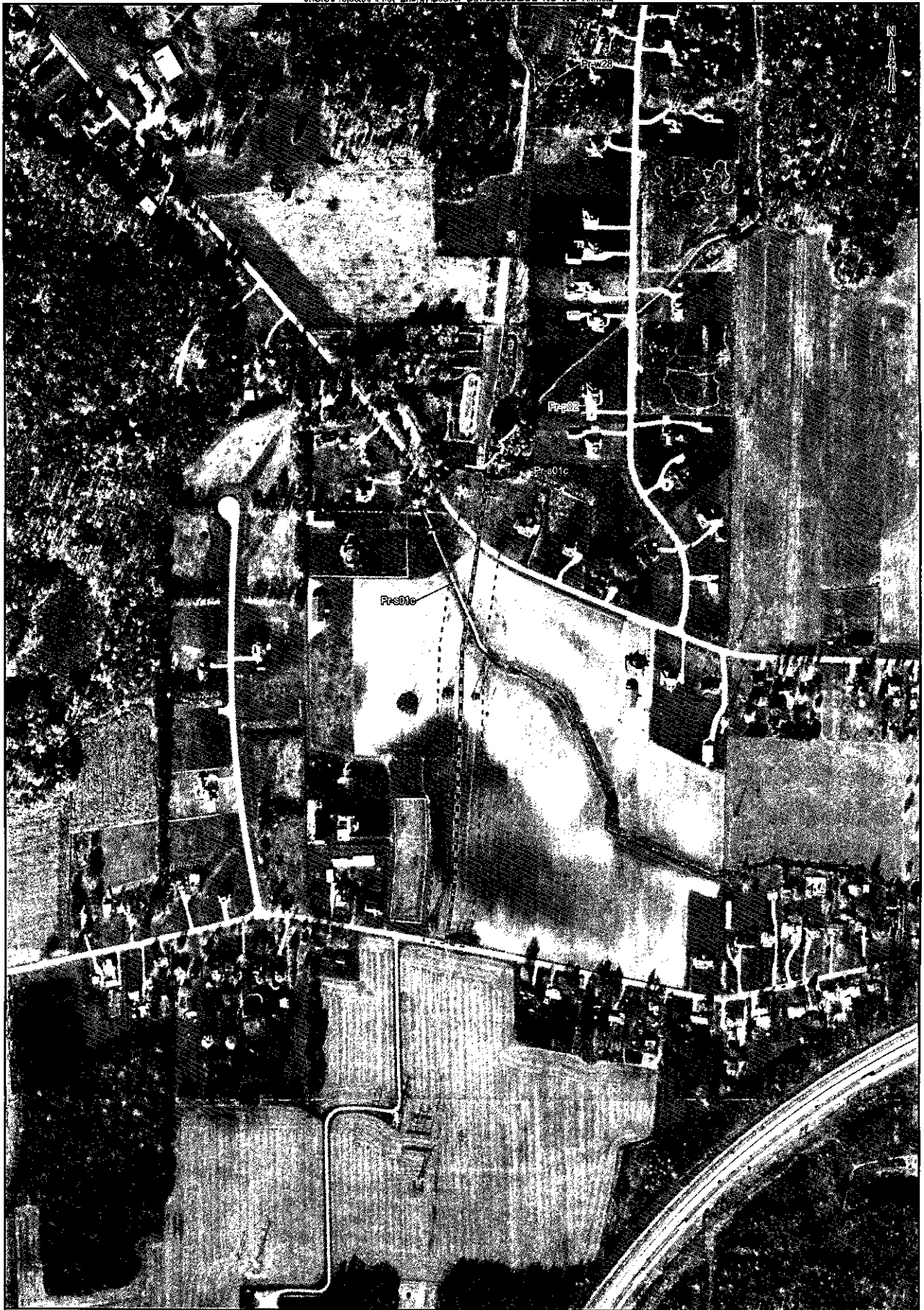
**ATSI** Beaver-Brownhelm Junction  
345kV Transmission Line

**FIGURE 3C**  
ALTERNATE ROUTE  
WETLAND DELINEATION AND  
STREAM ASSESSMENT MAP

JOB NO. 14950065

**URS**





**LEGEND:**

- Beaver Substation
- Alternate Route Centerline
- - - Ecological Survey Corridor
- HHEI Delineated Stream
- QHEI Delineated Stream
- Delineated Pond
- Delineated Wetland

0 400 800

Scale In Feet

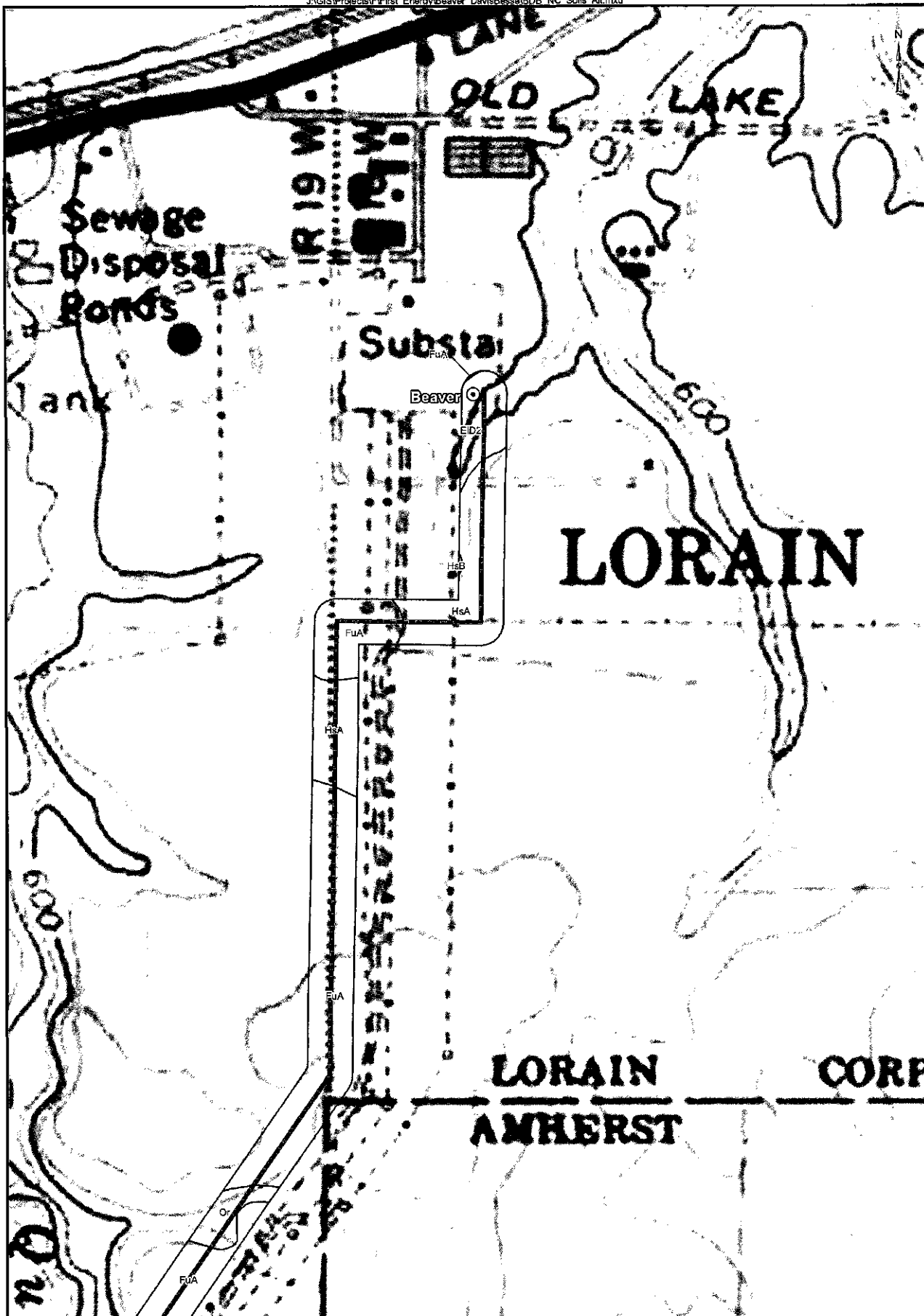
BASE MAP SOURCE:  
ArcGIS Map Service  
Aerials Express  
Cleveland, 2009

**ATSI** Beaver-Brownhelm Junction  
345kV Transmission Line

**FIGURE 3D**  
**ALTERNATE ROUTE**  
**WETLAND DELINEATION AND**  
**STREAM ASSESSMENT MAP**

JOB NO. 14950065

**URS**



**LEGEND:**

- Beaver Substation
- Alternate Route Centerline
- Soil Series within Ecological Survey Boundary\*

\* Refer to Table 1 for Soil Series Names

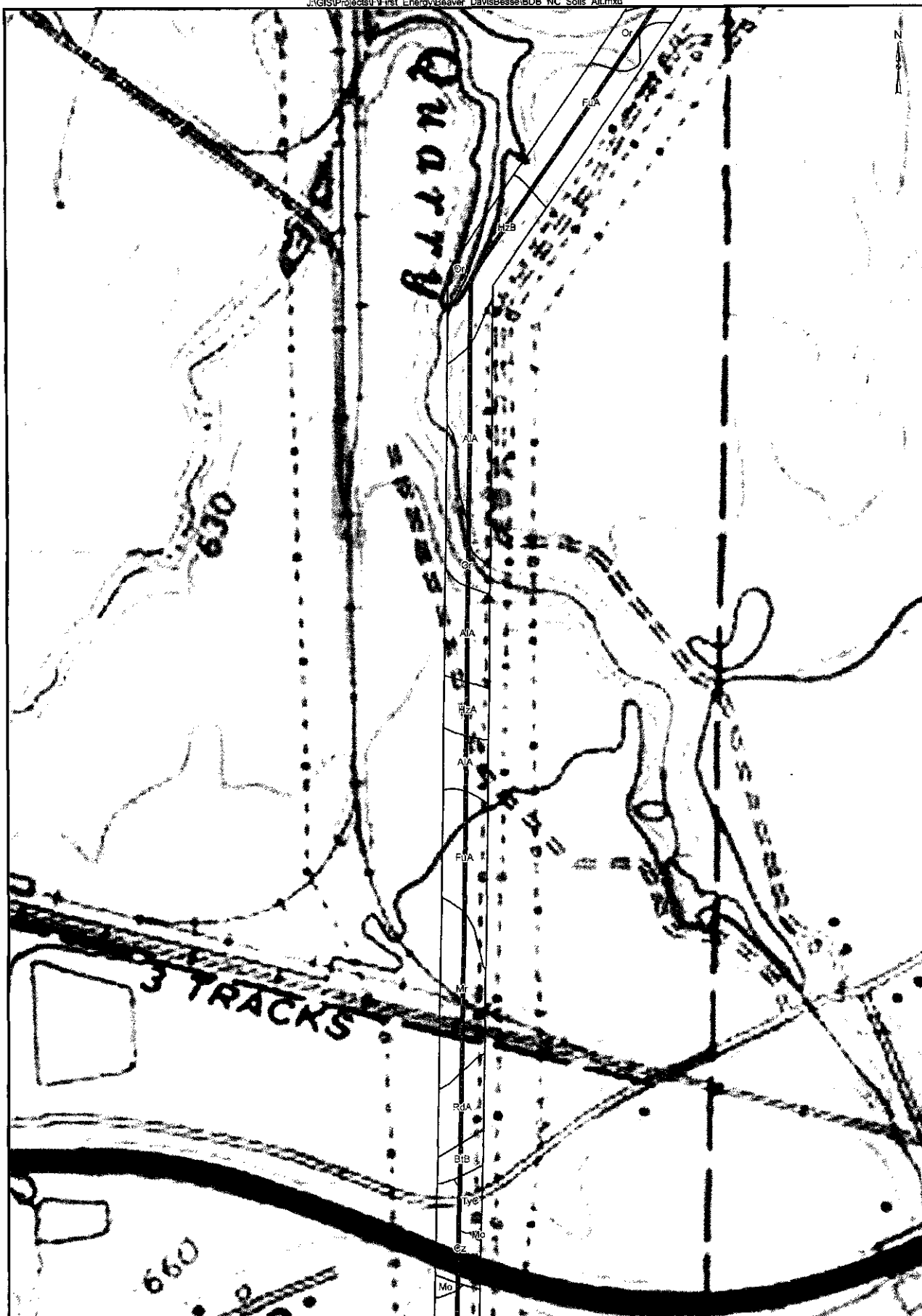
0 400 800

Scale In Feet

BASE MAP SOURCE:  
ArcGIS Map Service  
<http://services.arcgisonline.com/v92>  
NGS\_Topo\_US\_2D

**ATSI** Beaver-Brownheim Junction  
345kV Transmission Line

FIGURE 4A  
ALTERNATE ROUTE  
SOILS MAP



**LEGEND:**

- ⊙ Beaver Substation
- Alternate Route Centerline
- Soil Series within Ecological Survey Boundary\*

\* Refer to Table 1 for Soil Series Names

0 400 800

Scale In Feet

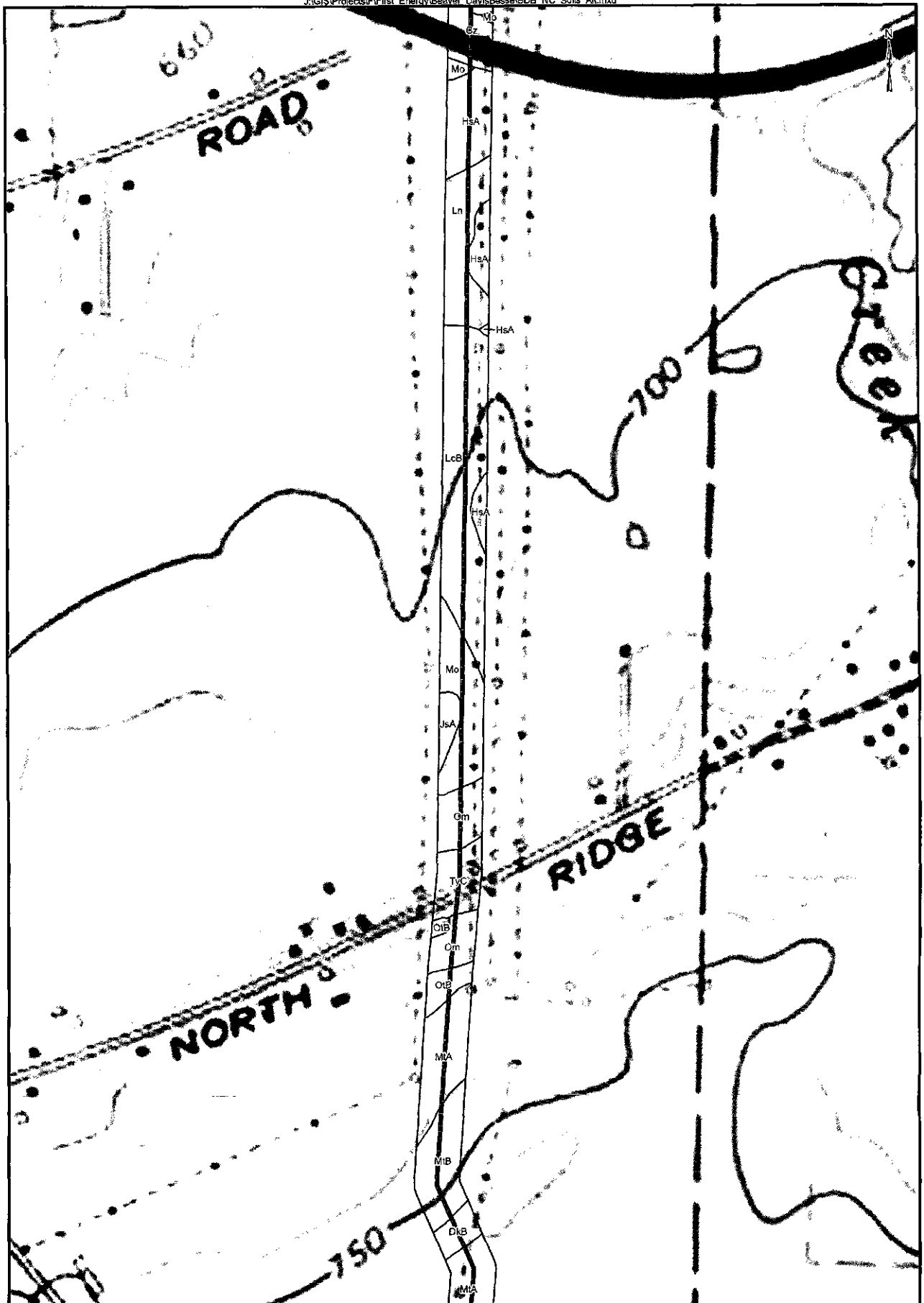
BASE MAP SOURCE:  
ArcGIS Map Service  
<http://services.arcgis.com/v92>  
NGS\_Topc\_US\_2D

**ATSI** Beaver-Brownhelm Junction  
345kV Transmission Line

**FIGURE 4B**  
**ALTERNATE ROUTE**  
**SOILS MAP**

JOB NO. 14550065

**URS**



**LEGEND:**

- ⊙ Beaver Substation
- Alternate Route Centerline
- Soil Series within Ecological Survey Boundary\*

\* Refer to Table 1 for Soil Series Names

0 400 800

Scale In Feet

BASE MAP SOURCE:  
ArcGIS Map Service  
<http://services.arcgis.com/v92>  
NGS\_Topo\_US\_2D

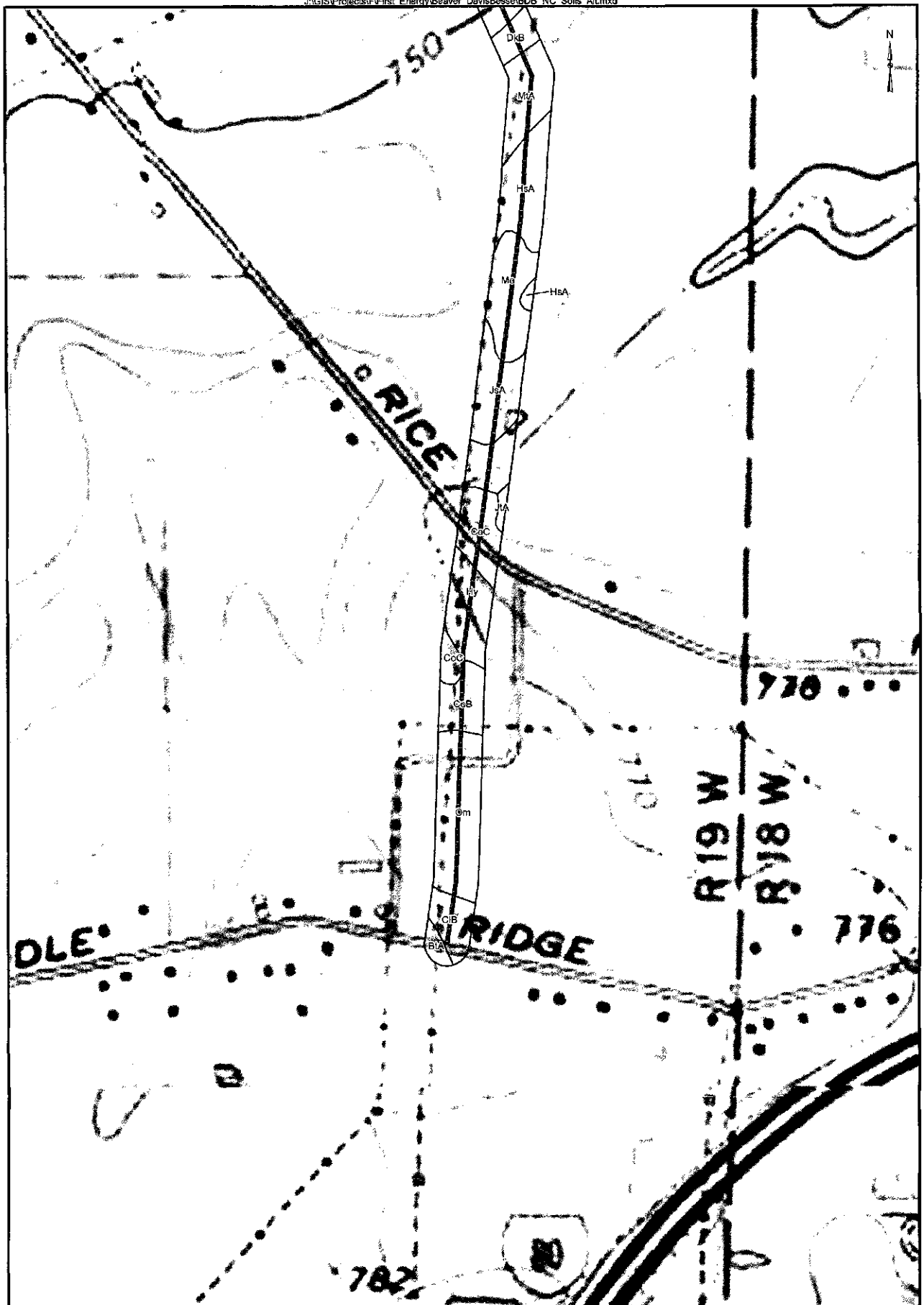
**ATSI** Beaver-Brownhelm Junction  
345kV Transmission Line

**FIGURE 4C**  
**ALTERNATE ROUTE**  
**SOILS MAP**

JOB NO. 14950065

**URS**





**LEGEND:**

- ⊙ Beaver Substation
- Alternate Route Centerline
- Soil Series within Ecological Survey Boundary\*

\* Refer to Table 1 for Soil Series Names

0 400 800

Scale In Feet

BASE MAP SOURCE:  
ArcGIS Map Service  
<http://services.arcgis.com/v92>  
NGS\_Topo\_US\_2D

**ATSI** Beaver-Brownhelm Junction  
345KV Transmission Line

**FIGURE 4D  
ALTERNATE ROUTE  
SOILS MAP**

JOB NO. 14950065

**URS**

**APPENDIX A****U.S. ARMY CORPS OF ENGINEERS WETLAND FORMS**

Pr-W01

W-MDT051811-2

## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: FE Beaver Dam Base (New) City/County: Lorain County Sampling Date: 18 May 2011  
 Applicant/Owner: First Energy State: OH Sampling Point: 2  
 Investigator(s): M. Thorne, S. Polgar Section, Township, Range: T7N, R18W  
 Landform (hillslope, terrace, etc.): Base of Hill Local relief (concave, convex, none): concave  
 Slope (%): 12 Lat: 41.426745 Long: -82.261577 Datum: WGS1984  
 Soil Map Unit Name: E1D2 NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID: _____	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks: (Explain alternative procedures here or in a separate report.) <u>PEM wetland just south of Beaver Substation. Phragmites dominates eastern portion of the wetland, and cattails at western side.</u>			

## HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input checked="" type="checkbox"/> Crayfish Burrows (C8)	
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations:			
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>0"-6"</u>		
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>Surface</u>		
(includes capillary fringe)		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: <u>Man made berms surround wetland (probably associated with construction of adjacent Beaver substation) on northern side.</u> <u>Small swale meanders through wetland</u>			

## VEGETATION – Use scientific names of plants.

Sampling Point: \_\_\_\_\_

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)  Total Number of Dominant Species Across All Strata: _____ (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
1. <u>None</u>				
2. _____				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
3. _____				
4. _____				<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
5. _____				
6. _____				<b>Definitions of Vegetation Strata:</b>  <b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vines</b> – All woody vines greater than 3.28 ft in height.
7. _____				
<b>Sapling/Shrub Stratum</b> (Plot size: _____) 1. <u>Sandbar willow</u> 10 OBL 2. <u>Potamogeton nodosus</u> 5 FACW 3. <u>Pine oak</u> 2 FACW 4. _____ 5. _____ 6. _____ 7. _____ 17 = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
<b>Herb Stratum</b> (Plot size: _____) 1. <u>Phragmites australis</u> 45 FACW 2. <u>Typha latifolia</u> 25 OBL 3. <u>Juncus effusus</u> 5 FACW 4. <u>Carex sp.</u> 10 FAC 5. <u>Equisetum arvense</u> 5 FAC 6. <u>Juncus sp.</u> 5 FAC 7. <u>Impatiens capensis</u> 5 FACW 8. _____ 9. _____ 10. _____ 11. _____ 12. _____ _____ = Total Cover				
<b>Woody Vine Stratum</b> (Plot size: _____) 1. _____ 2. _____ 3. _____ 4. _____ _____ = Total Cover				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Eastern portion of wetland is dominated by Phragmites, and western side is dominated by broadleaf cattail.

## SOIL

Sampling Point: \_\_\_\_\_

**Profile Description:** (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- |   |  |
|---|--|
| <input type="checkbox"/> Histosol (A1)                        | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R,      |
| <input type="checkbox"/> Histic Epipedon (A2)                 | <b>MLRA 149B)</b>  |
| <input type="checkbox"/> Black Histic (A3)                    | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B) |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)       |
| <input type="checkbox"/> Stratified Layers (A5)               | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)    | <input checked="" type="checkbox"/> Depleted Matrix (F3)           |
| <input type="checkbox"/> Thick Dark Surface (A12)             | <input type="checkbox"/> Redox Dark Surface (F6)                   |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)             | <input type="checkbox"/> Depleted Dark Surface (F7)                |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)             | <input type="checkbox"/> Redox Depressions (F8)                    |
| <input type="checkbox"/> Sandy Redox (S5)                     |  |
| <input type="checkbox"/> Stripped Matrix (S6)                 |  |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) |  |

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)  
☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ Polyvalue Below Surface (S8) (LRR K, L)  
☐ Thin Dark Surface (S9) (LRR K, L)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Piedmont Floodplain Soils (F19) (MLRA 149B)  
☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)  
☐ Red Parent Material (TF2)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

## Remarks:

Soil couldn't be collected below 6" due to saturation

Pr-W02

W-MDI 03/11-3

## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: FE Beaver Dam - Base (New Port) City/County: Lacien Co. Sampling Date: 13 May 2011  
 Applicant/Owner: First Energy State: OH Sampling Point: 3  
 Investigator(s): M. Thomaier, S. Polgar Section, Township, Range: T7N, R18W  
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave  
 Slope (%): 1 Lat: 41.424762 Long: -82.261628 Datum: WGS 1984  
 Soil Map Unit Name: H5A NWI classification: NA  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No      (If no, explain in Remarks.)  
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No       
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u>    </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u>    </u>
Hydric Soil Present? Yes <u>X</u> No <u>    </u>	If yes, optional Wetland Site ID: <u>    </u>
Wetland Hydrology Present? Yes <u>X</u> No <u>    </u>	
Remarks: (Explain alternative procedures here or in a separate report.) <u>PEM wetland surrounded by ROW for several TX lines.</u> <u>Wetland is dominated by carex and grass species</u>	

## HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<u>X</u> Surface Water (A1)	<u>    </u> Water-Stained Leaves (B9)	<u>    </u> Surface Soil Cracks (B6)	
<u>    </u> High Water Table (A2)	<u>X</u> Aquatic Fauna (B13)	<u>    </u> Drainage Patterns (B10)	
<u>X</u> Saturation (A3)	<u>    </u> Marl Deposits (B15)	<u>    </u> Moss Trim Lines (B16)	
<u>    </u> Water Marks (B1)	<u>    </u> Hydrogen Sulfide Odor (C1)	<u>    </u> Dry-Season Water Table (C2)	
<u>    </u> Sediment Deposits (B2)	<u>    </u> Oxidized Rhizospheres on Living Roots (C3)	<u>    </u> Crayfish Burrows (C8)	
<u>    </u> Drift Deposits (B3)	<u>    </u> Presence of Reduced Iron (C4)	<u>    </u> Saturation Visible on Aerial Imagery (C9)	
<u>    </u> Algal Mat or Crust (B4)	<u>    </u> Recent Iron Reduction in Tilled Soils (C6)	<u>    </u> Stunted or Stressed Plants (D1)	
<u>    </u> Iron Deposits (B5)	<u>    </u> Thin Muck Surface (C7)	<u>    </u> Geomorphic Position (D2)	
<u>    </u> Inundation Visible on Aerial Imagery (B7)	<u>    </u> Other (Explain in Remarks)	<u>    </u> Shallow Aquitard (D3)	
<u>    </u> Sparsely Vegetated Concave Surface (B8)		<u>    </u> Microtopographic Relief (D4)	
		<u>    </u> FAC-Neutral Test (D5)	
Field Observations:			
Surface Water Present? Yes <u>X</u> No <u>    </u>	Depth (inches): <u>0" - 6"</u>		
Water Table Present? Yes <u>    </u> No <u>X</u>	Depth (inches): <u>    </u>		
Saturation Present? (includes capillary fringe) Yes <u>X</u> No <u>    </u>	Depth (inches): <u>Surface</u>	Wetland Hydrology Present? Yes <u>X</u> No <u>    </u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: <u>Wetland is located in shallow depression &amp; is surrounded by slight hills. Observed a frog in the wetland</u>			

**VEGETATION** – Use scientific names of plants.

W-MS 051811 - 3

Sampling Point: \_\_\_\_\_

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:														
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)  Total Number of Dominant Species Across All Strata: <u>6</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. <u>(none)</u>	_____	_____	_____															
<u>0</u> = Total Cover				<b>Prevalence Index worksheet:</b> <table style="width: 100%;"> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> <tr> <td>OBL species <u>25</u></td> <td>x 1 = <u>25</u></td> </tr> <tr> <td>FACW species <u>11</u></td> <td>x 2 = <u>22</u></td> </tr> <tr> <td>FAC species <u>80</u></td> <td>x 3 = <u>240</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>146</u> (A)</td> <td><u>287</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.47</u>	Total % Cover of:	Multiply by:	OBL species <u>25</u>	x 1 = <u>25</u>	FACW species <u>11</u>	x 2 = <u>22</u>	FAC species <u>80</u>	x 3 = <u>240</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>146</u> (A)	<u>287</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>25</u>	x 1 = <u>25</u>																	
FACW species <u>11</u>	x 2 = <u>22</u>																	
FAC species <u>80</u>	x 3 = <u>240</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>146</u> (A)	<u>287</u> (B)																	
<b>Sapling/Shrub Stratum (Plot size: _____)</b>																		
1. <u>Pin oak</u>	<u>2</u>	<u>yes</u>	<u>FACW</u>															
2. <u>Redsier dogwood</u>	<u>2</u>	<u>yes</u>	<u>FACW</u>															
3. <u>Fraxinus pennsylvanica</u>	<u>2</u>	<u>yes</u>	<u>FACW</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
<u>6</u> = Total Cover																		
<b>Herb Stratum (Plot size: _____)</b>																		
1. <u>Carex species (2 species)</u>	<u>50</u>	<u>yes</u>	<u>FAC</u>															
2. <u>Unk. grass sp.</u>	<u>20</u>	<u>yes</u>	<u>FAC</u>															
3. <u>Swamp milkweed</u>	<u>20</u>	<u>yes</u>	<u>OBL</u>															
4. <u>Teasel</u>	<u>5</u>	<u>no</u>	<u>NI</u>															
5. <u>Bluestem (Andropogon gerardi)</u>	<u>5</u>	<u>no</u>	<u>FAC</u>															
6. <u>Nodding bullrush</u>	<u>5</u>	<u>no</u>	<u>OBL</u>															
7. <u>Juncus sp.</u>	<u>5</u>	<u>no</u>	<u>FAC</u>															
8. <u>Juncus effusus</u>	<u>5</u>	<u>no</u>	<u>FACW</u>															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>115</u> = Total Cover																		
<b>Woody Vine Stratum (Plot size: _____)</b>																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. <u>(none)</u>	_____	_____	_____															
<u>0</u> = Total Cover																		
<b>Remarks: (Include photo numbers here or on a separate sheet.)</b> <u>Wetland is dominated by 2 species of Carex.</u>																		

**Hydrophytic Vegetation Indicators:**  
 Rapid Test for Hydrophytic Vegetation  
☒ Dominance Test is >50%  
☒ Prevalence Index is ≤3.0<sup>1</sup>  
 — Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 — Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**  
  
**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  
  
**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  
  
**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  
  
**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes X No \_\_\_\_\_

W-MDT 051811-3  
Sampling Point: \_\_\_\_\_

**Profile Description:** (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- <sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Hydric Soil Present? Yes ☒ No ☐

Northcentral and Northeast Region – Interim Version



Pr-W03

W-MDT051811-4

## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: First Energy Beaver Dams Base City/County: Lorain Co. Sampling Date: 18 May 2011  
 Applicant/Owner: First Energy State: OH Sampling Point: 4  
 Investigator(s): M. Thomayer S. Polgar Section, Township, Range: T7N, R18W  
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave  
 Slope (%): 1 Lat: 41.424372 Long: -82.26159 Datum: WGS 1984  
 Soil Map Unit Name: HsA NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.) <u>PEM wetland bordered by ROW for 2 transmission lines, and</u> <u>woodlot. East and west sides are connected by smaller band of wetland.</u> <u>East side is dominated by Typha latifolia and west side is</u> <u>dominated by Phalaris and Carex sp.</u>	

## HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Fauna (B13) tadpoles	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations:			
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>1" - 6"</u>		
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____		
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>surface</u>		
(includes capillary fringe)		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: _____			
Remarks: <u>Sides of wetland gently slope down to center, where</u> <u>water is deepest (6"). Observed tadpoles in standing</u> <u>water during delineation.</u>			

**VEGETATION** – Use scientific names of plants.

W-MST 05/811-4  
Sampling Point: \_\_\_\_\_

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:														
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)														
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>5</u> (B)														
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
4. _____	_____	_____	_____	<b>Prevalence Index worksheet:</b> <table style="width: 100%;"> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> <tr> <td>OBL species <u>55</u></td> <td>x 1 = <u>55</u></td> </tr> <tr> <td>FACW species <u>67</u></td> <td>x 2 = <u>134</u></td> </tr> <tr> <td>FAC species <u>15</u></td> <td>x 3 = <u>45</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>137</u> (A)</td> <td><u>234</u> (B)</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>55</u>	x 1 = <u>55</u>	FACW species <u>67</u>	x 2 = <u>134</u>	FAC species <u>15</u>	x 3 = <u>45</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>137</u> (A)	<u>234</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>55</u>	x 1 = <u>55</u>																	
FACW species <u>67</u>	x 2 = <u>134</u>																	
FAC species <u>15</u>	x 3 = <u>45</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>137</u> (A)	<u>234</u> (B)																	
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____ (none)	_____	_____	_____															
<b>Sapling/Shrub Stratum</b> (Plot size: _____)				Prevalence Index = B/A = <u>1.71</u>														
1. <u>Green ash</u>	<u>2</u>	<u>yes</u>	<u>FACW</u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)														
2. <u>Red River dogwood</u>	<u>5</u>	<u>yes</u>	<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<b>Herb Stratum</b> (Plot size: _____)				<b>Definitions of Vegetation Strata:</b>  <b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vines</b> – All woody vines greater than 3.28 ft in height.   <b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____														
1. <u>Typha latifolia</u>	<u>50</u>	<u>yes</u>	<u>OBL</u>															
2. <u>Soft rush</u>	<u>20</u>	<u>yes</u>	<u>FACW</u>															
3. <u>Small rush (unk)</u>	<u>5</u>	<u>no</u>	<u>FAC</u>															
4. <u>Sensitive fern</u>	<u>10</u>	<u>no</u>	<u>FACW</u>															
5. <u>black mustard</u>	<u>2</u>	<u>no</u>	<u>NE</u>															
6. <u>Phragmites australis</u>	<u>10</u>	<u>no</u>	<u>FACW</u>															
7. <u>Carex sp</u>	<u>10</u>	<u>no</u>	<u>FAC</u>															
8. <u>Phalaris arundinacea</u>	<u>20</u>	<u>yes</u>	<u>FACW</u>															
9. <u>Swamp milkweed</u>	<u>5</u>	<u>no</u>	<u>OBL</u>															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<b>Woody Vine Stratum</b> (Plot size: _____)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____ (none)	_____	_____	_____															

Remarks: (Include photo numbers here or on a separate sheet.)

East side of wetland is dominated by Soft rush and cattails.  
West side of wetland is dominated by Phalaris



Alt-W01

W-MDT-083111-03

## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: FE BDB - Alternate Route City/County: LORAIN Sampling Date: 31 AUG 2011  
 Applicant/Owner: FIRST ENERGY State: OH Sampling Point: 03  
 Investigator(s): BAG, MDT Section, Township, Range: T6N, R19W  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): \_\_\_\_\_  
 Slope (%): \_\_\_\_\_ Lat: 41.416545 Long: -82.265721 Datum: \_\_\_\_\_  
 Soil Map Unit Name: FuA NWI classification: n/a  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No \_\_\_\_\_  
 Hydric Soil Present? Yes ☒ No \_\_\_\_\_  
 Wetland Hydrology Present? Yes ☒ No \_\_\_\_\_

Is the Sampled Area within a Wetland? Yes ☒ No \_\_\_\_\_  
 If yes, optional Wetland Site ID: \_\_\_\_\_

Remarks: (Explain alternative procedures here or in a separate report.)

PEM WETLAND W/IN FIRST ENERGY ROW

## HYDROLOGY

## Wetland Hydrology Indicators:

## Primary Indicators (minimum of one is required; check all that apply)

☐ Surface Water (A1) ☐ Water-Stained Leaves (B9)  
☐ High Water Table (A2) ☐ Aquatic Fauna (B13)  
☐ Saturation (A3) ☐ Marl Deposits (B15)  
☐ Water Marks (B1) ☐ Hydrogen Sulfide Odor (C1)  
☐ Sediment Deposits (B2) ☒ Oxidized Rhizospheres on Living Roots (C3)  
☐ Drift Deposits (B3) ☐ Presence of Reduced Iron (C4)  
☐ Algal Mat or Crust (B4) ☐ Recent Iron Reduction in Tilled Soils (C6)  
☐ Iron Deposits (B5) ☐ Thin Muck Surface (C7)  
☐ Inundation Visible on Aerial Imagery (B7) ☐ Other (Explain in Remarks)  
☐ Sparsely Vegetated Concave Surface (B8)

## Secondary Indicators (minimum of two required)

☐ Surface Soil Cracks (B6)  
☒ Drainage Patterns (B10)  
☐ Moss Trim Lines (B16)  
☐ Dry-Season Water Table (C2)  
☒ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes \_\_\_\_\_ No ☒ Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No ☒ Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No ☒ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No \_\_\_\_\_

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## VEGETATION – Use scientific names of plants.

Sampling Point: \_\_\_\_\_

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
		_____ = Total Cover	

Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
		_____ = Total Cover	

Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>PHILIPPOPHYS australis</i>	30	yes	FACW
2. <i>JUNCUS EFFUSEC</i>	20	yes	FACW
3. Drooping Bulrush - <i>Scirpus pendulus</i>	20	yes	OBL
4. Small flower Agrostis - <i>A. parviflora</i>	10	no	FAC
5. <i>bosizane</i> - <i>Apocynum cannabinum</i>	5	no	FACU
6. <i>Polygonum sp.</i>	5	no	OBL
7. <i>ERUPE sp.</i>	5	no	FAC
8. <i>Polygonum sp.</i>	5	no	FAC
9. _____			
10. _____			
11. _____			
12. _____			
		100 = Total Cover 20/50	

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
		_____ = Total Cover	

## Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)Total Number of Dominant Species Across All Strata: 3 (B)Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

## Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>25</u>	x 1 = <u>25</u>
FACW species <u>50</u>	x 2 = <u>100</u>
FAC species <u>20</u>	x 3 = <u>60</u>
FACU species <u>5</u>	x 4 = <u>20</u>
UPL species _____	x 5 = _____
Column Totals: <u>100</u> (A)	<u>205</u> (B)

Prevalence Index = B/A = 2.05

## Hydrophytic Vegetation Indicators:

Rapid Test for Hydrophytic Vegetation

☒ Dominance Test is >50%☒ Prevalence Index is ≤3.0<sup>1</sup>Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

## Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes ☒ No \_\_\_\_\_

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: \_\_\_\_\_

**Profile Description:** (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- |   |  |
|---|--|
| <input type="checkbox"/> Histosol (A1)                        | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> Histic Epipedon (A2)                 | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)       |
| <input type="checkbox"/> Black Histic (A3)                    | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)             |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                        |
| <input type="checkbox"/> Stratified Layers (A5)               | <input type="checkbox"/> Depleted Matrix (F3)                            |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)    | <input type="checkbox"/> Redox Dark Surface (F6)                         |
| <input type="checkbox"/> Thick Dark Surface (A12)             | <input type="checkbox"/> Depleted Dark Surface (F7)                      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)             | <input type="checkbox"/> Redox Depressions (F8)                          |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)             |  |
| <input type="checkbox"/> Sandy Redox (S5)                     |  |
| <input type="checkbox"/> Stripped Matrix (S6)                 |  |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) |  |

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)  
☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ Polyvalue Below Surface (S8) (LRR K, L)  
☐ Thin Dark Surface (S9) (LRR K, L)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Piedmont Floodplain Soils (F19) (MLRA 149B)  
☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)  
☐ Red Parent Material (TF2)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes No

Remarks:

OXIDIZED ROOT CHANNELS

W-BAO-091511-05

Alt-w 02

## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: FE BODB - ALTERNATE ROUTE City/County: LORAIN Sampling Date: 091511  
 Applicant/Owner: FIRST ENERGY State: OH Sampling Point: 5  
 Investigator(s): BAO, NOT Section, Township, Range: T6N, R19W  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): \_\_\_\_\_  
 Slope (%): \_\_\_\_\_ Lat: 41.405777 Long: -82.268163 Datum: \_\_\_\_\_  
 Soil Map Unit Name: Mr NWI classification: n/g

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No \_\_\_\_\_  
 Hydric Soil Present? Yes X No \_\_\_\_\_  
 Wetland Hydrology Present? Yes X No \_\_\_\_\_

Is the Sampled Area within a Wetland? Yes X No \_\_\_\_\_  
 If yes, optional Wetland Site ID: \_\_\_\_\_

Remarks: (Explain alternative procedures here or in a separate report.)

PEM WETLAND LOCATED TO THE NORTH OF RAILROAD TRACKS WITHIN EXISTING  
 FE ROW.

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

X Surface Water (A1) \_\_\_\_\_ Water-Stained Leaves (B9)  
 \_\_\_\_\_ High Water Table (A2) \_\_\_\_\_ Aquatic Fauna (B13)  
X Saturation (A3) \_\_\_\_\_ Marl Deposits (B15)  
 \_\_\_\_\_ Water Marks (B1) \_\_\_\_\_ Hydrogen Sulfide Odor (C1)  
 \_\_\_\_\_ Sediment Deposits (B2) \_\_\_\_\_ Oxidized Rhizospheres on Living Roots (C3)  
 \_\_\_\_\_ Drift Deposits (B3) \_\_\_\_\_ Presence of Reduced Iron (C4)  
 \_\_\_\_\_ Algal Mat or Crust (B4) \_\_\_\_\_ Recent Iron Reduction in Tilled Soils (C6)  
 \_\_\_\_\_ Iron Deposits (B5) \_\_\_\_\_ Thin Muck Surface (C7)  
 \_\_\_\_\_ Inundation Visible on Aerial Imagery (B7) \_\_\_\_\_ Other (Explain in Remarks)  
 \_\_\_\_\_ Sparsely Vegetated Concave Surface (B8)

## Secondary Indicators (minimum of two required)

\_\_\_\_\_ Surface Soil Cracks (B6)  
X Drainage Patterns (B10)  
 \_\_\_\_\_ Moss Trim Lines (B16)  
 \_\_\_\_\_ Dry-Season Water Table (C2)  
X Crayfish Burrows (C8)  
 \_\_\_\_\_ Saturation Visible on Aerial Imagery (C9)  
 \_\_\_\_\_ Stunted or Stressed Plants (D1)  
 \_\_\_\_\_ Geomorphic Position (D2)  
 \_\_\_\_\_ Shallow Aquitard (D3)  
 \_\_\_\_\_ Microtopographic Relief (D4)  
X FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes X No \_\_\_\_\_ Depth (inches): 3W  
 Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes X No \_\_\_\_\_ Depth (inches): SURFACE  
 (includes capillary fringe)

Wetland Hydrology Present? Yes X No \_\_\_\_\_

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## VEGETATION – Use scientific names of plants.

Sampling Point: \_\_\_\_\_

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. EASTERN COTTONWOOD - <i>P. deltoides</i>	10	X	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. GREEN ASH - <i>F. pennsylvanica</i>	5	X	FACW	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. AMERICAN ELM - <i>Ulmus americana</i>	2		FACW	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species <u>77</u> x 1 = <u>77</u> FACW species <u>22</u> x 2 = <u>44</u> FAC species <u>14</u> x 3 = <u>42</u> FACU species <u>7</u> x 4 = <u>28</u> UPL species _____ x 5 = _____ Column Totals: <u>120</u> (A) <u>191</u> (B) Prevalence Index = B/A = <u>1.59</u>
5. _____				
6. _____				
7. _____				
_____ = Total Cover <u>17</u>				
<b>Sapling/Shrub Stratum (Plot size: _____)</b>				<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. RED OAK DOGWOOD - <i>C. sericea</i>	10	X	FACW	
2. ARROWWOOD VIBURNUM - <i>V. dentatum</i>	2		FAC	
3. HAWTHORN - <i>Crataegus crus-galli</i>	2		FACU	
4. _____				
5. _____				<b>Definitions of Vegetation Strata:</b> Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____
11. _____				
12. _____				
_____ = Total Cover <u>14</u>				
<b>Herb Stratum (Plot size: _____)</b>				
1. NARROW LEAF CATTAIL - <i>T. angustifolia</i>	45	X	OBL	<b>Woody Vine Stratum (Plot size: _____)</b> 1. _____ 2. _____ 3. _____ 4. _____ _____ = Total Cover _____
2. BONESET - <i>E. perfoliatum</i>	5		FACW	
3. NOOTING BEEBEETLE - <i>Bidens cernua</i>	10		OBL	
4. _____				
5. DOB BANE - <i>Apocynum cannabinum</i>	5		FACU	
6. SMALL FLOWER GERMAN - <i>A. parviflora</i>	3		FAC	<b>Remarks: (Include photo numbers here or on a separate sheet.)</b>  PEM WETLAND w/ some PSS & pro (small patches)
7. SWAMP MILKWEED - <i>A. incarnata</i>	2		OBL	
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
_____ = Total Cover <u>89</u>				



## SOIL

**Sampling Point:** \_\_\_\_\_

**Profile Description:** (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- |  |   |
|--|---|
| <input type="checkbox"/> Histosol (A1)                               | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R,             |
| <input type="checkbox"/> Histic Epipedon (A2)                        | <b>MLRA 149B)</b>   |
| <input type="checkbox"/> Black Histic (A3)                           | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, <b>MLRA 149B)</b> |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                       | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)              |
| <input type="checkbox"/> Stratified Layers (A5)                      | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                         |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)           | <input checked="" type="checkbox"/> Depleted Matrix (F3)                  |
| <input type="checkbox"/> Thick Dark Surface (A12)                    | <input type="checkbox"/> Redox Dark Surface (F6)                          |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                    | <input type="checkbox"/> Depleted Dark Surface (F7)                       |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                    | <input type="checkbox"/> Redox Depressions (F8)                           |
| <input type="checkbox"/> Sandy Redox (S5)                            |   |
| <input type="checkbox"/> Stripped Matrix (S6)                        |   |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, <b>MLRA 149B)</b> |   |

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)  
☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ Polyvalue Below Surface (S8) (LRR K, L)  
☐ Thin Dark Surface (S9) (LRR K, L)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Piedmont Floodplain Soils (F19) (MLRA 149B)  
☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)  
☐ Red Parent Material (TF2)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes X No       

Remarks:

W-BAO-091511-04

Alt - W03

## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: FE BDB - ALTERNATE ROUTE City/County: LORAIN Sampling Date: 09/11  
 Applicant/Owner: FIRST ENERGY State: OH Sampling Point: 4  
 Investigator(s): B. Otto, M. Thomayer Section, Township, Range: T6N, R19W  
 Landform (hillslope, terrace, etc.): Ditch between r.r. tracks Local relief (concave, convex, none): Concave  
 Slope (%): \_\_\_\_\_ Lat: 41.405498 Long: -82.268506 Datum: \_\_\_\_\_  
 Soil Map Unit Name: Mr NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation N, Soil Y, or Hydrology N significantly disturbed? Ⓟ Are "Normal Circumstances" present? Yes \_\_\_\_\_ No X  
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <u>X</u> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

PEMYPSS WETLAND THAT IS LOCATED BETWEEN TWO SETS OF RAILROAD TRACKS.  
WETLAND IS PRIMARILY CATTAILS.

Ⓟ SOILS ARE IMPACTED BY IRON RUNOFF FROM RAILROAD TRACKS

## HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<u>X</u> Surface Water (A1)	_____ Surface Soil Cracks (B6)
_____ High Water Table (A2)	<u>X</u> Drainage Patterns (B10)
<u>X</u> Saturation (A3)	_____ Moss Trim Lines (B16)
_____ Water Marks (B1)	_____ Dry-Season Water Table (C2)
_____ Sediment Deposits (B2)	_____ Crayfish Burrows (C8)
_____ Drift Deposits (B3)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Algal Mat or Crust (B4)	_____ Stunted or Stressed Plants (D1)
<u>X</u> Iron Deposits (B5)	_____ Geomorphic Position (D2)
_____ Inundation Visible on Aerial Imagery (B7)	_____ Shallow Aquitard (D3)
_____ Sparsely Vegetated Concave Surface (B8)	_____ Microtopographic Relief (D4)
_____ Water-Stained Leaves (B9)	_____ FAC-Neutral Test (D5)
_____ Aquatic Fauna (B13)	
_____ Marl Deposits (B15)	
_____ Hydrogen Sulfide Odor (C1)	
_____ Oxidized Rhizospheres on Living Roots (C3)	
_____ Presence of Reduced Iron (C4)	
_____ Recent Iron Reduction in Tilled Soils (C6)	
_____ Thin Muck Surface (C7)	
_____ Other (Explain in Remarks)	

## Field Observations:

Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>2 IN</u>	Wetland Hydrology Present? Yes <u>X</u> No _____
Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____	
Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>SURFACE</u> (includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## VEGETATION - Use scientific names of plants.

Sampling Point: \_\_\_\_\_

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
		= Total Cover	

Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>BLACK WILLOW - S. nigra</u>	<u>2</u>	<u>yes</u>	<u>FACW</u>
2. <u>GLOSSY BUCKTHORN - Fraxinus alnus</u>	<u>2</u>	<u>yes</u>	<u>FAC</u>
3. <u>PINE - Q. palustris</u>	<u>1</u>	<u>no</u>	<u>FACW</u>
4. <u>RED OSIER DOGWOOD - C. sericea</u>	<u>2</u>	<u>yes</u>	<u>FACW</u>
5. _____			
6. _____			
7. _____			
		= Total Cover	

Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>NARROW LEAF COTONWOOD - T. angustifolia</u>	<u>85</u>	<u>yes</u>	<u>DBL</u>
2. <u>BONASET - E. perfoliatum</u>	<u>5</u>	<u>no</u>	<u>FACW</u>
3. <u>JEWELWEED - Impatiens capensis</u>	<u>2</u>	<u>no</u>	<u>FACW</u>
4. <u>TURTLEHEAD - Chelone glabra</u>	<u>2</u>	<u>no</u>	<u>DBL</u>
5. <u>DOGbane - Apocynum cannabinum</u>	<u>2</u>	<u>no</u>	<u>FACW</u>
6. <u>SENSITIVE FERN - Onoclea sensibilis</u>	<u>1</u>	<u>no</u>	<u>FACW</u>
7. <u>SPHAGNUM MOSS sp.</u>	<u>5</u>	<u>no</u>	<u>FAC</u>
8. <u>WOLFGRASS - Scirpus cyperinus</u>	<u>2</u>	<u>no</u>	<u>FACW</u>
9. _____			
10. _____			
11. _____			
12. _____			
		= Total Cover	

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
		= Total Cover	

## Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)Total Number of Dominant Species Across All Strata: 4 (B)Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

## Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>87</u>	x 1 = <u>87</u>
FACW species <u>15</u>	x 2 = <u>30</u>
FAC species <u>7</u>	x 3 = <u>21</u>
FACU species <u>2</u>	x 4 = <u>8</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>111</u> (A)	<u>146</u> (B)

Prevalence Index = B/A = 1.32

## Hydrophytic Vegetation Indicators:

Rapid Test for Hydrophytic Vegetation

☒ Dominance Test is >50%☒ Prevalence Index is ≤3.0<sup>1</sup>Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

## Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

## Hydrophytic Vegetation Present?

Yes ☒ No \_\_\_\_\_

Remarks: (Include photo numbers here or on a separate sheet.)

Sampling Point: \_\_\_\_\_

**Profile Description:** (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- |   |  |
|---|--|
| <input type="checkbox"/> Histosol (A1)                        | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> Histic Epipedon (A2)                 | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)       |
| <input type="checkbox"/> Black Histic (A3)                    | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)             |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                        |
| <input type="checkbox"/> Stratified Layers (A5)               | <input type="checkbox"/> Depleted Matrix (F3)                            |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)    | <input type="checkbox"/> Redox Dark Surface (F6)                         |
| <input type="checkbox"/> Thick Dark Surface (A12)             | <input type="checkbox"/> Depleted Dark Surface (F7)                      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)             | <input type="checkbox"/> Redox Depressions (F8)                          |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)             |  |
| <input type="checkbox"/> Sandy Redox (S5)                     |  |
| <input type="checkbox"/> Stripped Matrix (S6)                 |  |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) |  |

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)  
☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ Polyvalue Below Surface (S8) (LRR K, L)  
☐ Thin Dark Surface (S9) (LRR K, L)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Piedmont Floodplain Soils (F19) (MLRA 149B)  
☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)  
☐ Red Parent Material (TF2)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes X No     

## Remarks:

(X) SOILS ARE IMPACTED BY ADJACENT RAILROAD TRACKS. SOILS  
APPEAR TO BE IMPACTED BY IRON RINOFF FROM RAILROAD TRACKS.  
WETLAND WAS INUNDATED & COULDN'T GET SOIL SAMPLE.

Alt - W046

W-Mdt 9/27/2011-16

## WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Bever Davis Bessie Alt Route City/County: Lorain County Sampling Date: 27 Sept 2011  
 Applicant/Owner: FirstEnergy State: OH Sampling Point: \_\_\_\_\_  
 Investigator(s): H. Thomaier, S. Kilosky; URS Section, Township, Range: T6N R19W  
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave  
 Slope (%): \_\_\_\_\_ Lat: 41.391456 Long: -82.26858 Datum: \_\_\_\_\_  
 Soil Map Unit Name: Om NWI classification: n1g

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No \_\_\_\_\_  
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No _____		
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No _____	If yes, optional Wetland Site ID:	_____

Remarks: (Explain alternative procedures here or in a separate report.)

PEM/PSS wetland that is located in existing transmission line ROW and was recently mowed. Part of larger wetland.

## HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

<input checked="" type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

## Secondary Indicators (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Microtopographic Relief (D4)
<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present?	Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>4"</u>
Water Table Present?	Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____
Saturation Present?	Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>surface</u>

Wetland Hydrology Present? Yes ☒ No \_\_\_\_\_

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

## Remarks:

Saturated throughout with inundation primarily near drainage swale.

**VEGETATION -- Use scientific names of plants.**

W-1104 9/27/2011 - 16  
Sampling Point: \_\_\_\_\_

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:														
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)														
2. _____				Total Number of Dominant Species Across All Strata: <u>5</u> (B)														
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)														
4. _____																		
5. _____																		
6. _____																		
7. _____																		
<u>0</u> = Total Cover				<b>Prevalence Index worksheet:</b> <table style="width: 100%;"> <thead> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> </thead> <tbody> <tr> <td>OBL species <u>30</u></td> <td>x 1 = <u>30</u></td> </tr> <tr> <td>FACW species <u>90</u></td> <td>x 2 = <u>180</u></td> </tr> <tr> <td>FAC species <u>10</u></td> <td>x 3 = <u>30</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>130</u> (A)</td> <td><u>240</u> (B)</td> </tr> </tbody> </table>	Total % Cover of:	Multiply by:	OBL species <u>30</u>	x 1 = <u>30</u>	FACW species <u>90</u>	x 2 = <u>180</u>	FAC species <u>10</u>	x 3 = <u>30</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>130</u> (A)	<u>240</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>30</u>	x 1 = <u>30</u>																	
FACW species <u>90</u>	x 2 = <u>180</u>																	
FAC species <u>10</u>	x 3 = <u>30</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>130</u> (A)	<u>240</u> (B)																	
<u>20</u> = Total Cover				Prevalence Index = B/A = <u>1.85</u>														
<b>Sapling/Shrub Stratum (Plot size: _____)</b>																		
1. <u>Bottlebrush - C. occidentalis</u>	<u>10</u>	<u>yes</u>	<u>OBL</u>															
2. <u>Arrowwood viburnum - V. dentatum</u>	<u>5</u>	<u>yes</u>	<u>FAC</u>															
3. <u>Glossy buckthorn - Frangula alnus</u>	<u>5</u>	<u>yes</u>	<u>FAC</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
<u>20</u> = Total Cover <u>4/10</u>																		
<b>Herb Stratum (Plot size: _____)</b>																		
1. <u>Woolgrass - Scirpus cyperinus</u>	<u>60</u>	<u>yes</u>	<u>FACW</u>															
2. <u>Sensitive Fern - Onoclea sensibilis</u>	<u>30</u>	<u>yes</u>	<u>FACW</u>															
3. <u>Narrowleaf cattail - T. angustifolia</u>	<u>10</u>	<u>no</u>	<u>OBL</u>															
4. <u>Polygonum sagittatum</u>	<u>10</u>	<u>no</u>	<u>OBL</u>															
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
<u>110</u> = Total Cover <u>22/55</u>																		
<b>Woody Vine Stratum (Plot size: _____)</b>																		
1. <u>None</u>																		
2. _____																		
3. _____																		
4. _____																		
<u>0</u> = Total Cover				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____														

**Hydrophytic Vegetation Indicators:**  
 \_\_\_ Rapid Test for Hydrophytic Vegetation  
☒ Dominance Test is >50%  
☒ Prevalence Index is ≤3.0<sup>1</sup>  
 \_\_\_ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 \_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**  
**Tree** -- Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  
**Sapling/shrub** -- Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  
**Herb** -- All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  
**Woody vines** -- All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?**  
 Yes X No \_\_\_\_\_

Remarks: (Include photo numbers here or on a separate sheet.)

WMD# 9/27/2011 - 16  
Sampling Point: \_\_\_\_\_

© 2000 Blackwell Science Ltd *Journal of Internal Medicine* 247: 105–112

[illegible]<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (LRR R, MLRA 149B)

☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)  
☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ Polyvalue Below Surface (S8) (LRR K, L)  
☐ Thin Dark Surface (S9) (LRR K, L)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Piedmont Floodplain Soils (F19) (MLRA 149B)  
☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)  
☐ Red Parent Material (TF2)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

Restrictive Layer (If observed):

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes X No       

Northcentral and Northeast Region – Interim Version

Alt-W 09a W-NAH 9/28/11-1a

**WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region**

Project/Site: Bever Davis Besse Alternate Route City/County: Lorain County Sampling Date: 28 Sept 2011  
 Applicant/Owner: First Energy State: OH Sampling Point: 19  
 Investigator(s): M. Thayer, J. Villalobos URS Section, Township, Range: T6N, R19W  
 Landform (hillslope, terrace, etc.): terrace, slight slope Local relief (concave, convex, none): slightly concave  
 Slope (%): \_\_\_\_\_ Lat: 41.394603 Long: -82.268756 Datum: \_\_\_\_\_  
 Soil Map Unit Name: JSA, Mo NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No \_\_\_\_\_  
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <p style="font-size: 1.2em; margin-top: 10px;">PEM/PSS wetland in and between existing ROWs. Part of larger wetland.</p>	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators (minimum of one is required; check all that apply)</b> <input checked="" type="checkbox"/> Surface Water (A1) _____ Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) _____ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) _____ Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) _____ Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) _____ Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<b>Secondary Indicators (minimum of two required)</b> <input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input checked="" type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1"</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>surface</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  	
Remarks: <p style="font-size: 1.2em; margin-top: 10px;">Wetland saturated throughout with inundation occurring in isolated pockets.</p>	



W-nd+9/28/11-1a

**VEGETATION – Use scientific names of plants.**

Sampling Point: \_\_\_\_\_

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Black willow - Salix nigra</u>	<u>5</u>	<u>yes</u>	<u>FACW</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
<u>5</u> = Total Cover			

Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>green ash - F. pennsylvanica</u>	<u>15</u>	<u>yes</u>	<u>FACW</u>
2. <u>redosier dogwood - C. sericea</u>	<u>20</u>	<u>yes</u>	<u>FACW</u>
3. <u>arrowwood viburnum - U. dentatum</u>	<u>5</u>	<u>no</u>	<u>FAC</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
<u>40</u> = Total Cover			

Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Japanese stilt grass - M. viminum</u>	<u>85</u>	<u>yes</u>	<u>NI</u>
2. <u>Impatiens capensis</u>	<u>5</u>	<u>no</u>	<u>FACW</u>
3. <u>Swamp milkweed - Asclepias incarnata</u>	<u>5</u>	<u>no</u>	<u>DBL</u>
4. <u>Narrow leaf cattail - Typha angustifolia</u>	<u>5</u>	<u>no</u>	<u>DBL</u>
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
<u>100</u> = Total Cover			

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>None</u>	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
<u>0</u> = Total Cover			

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <u>10</u>	x 1 = <u>10</u>
FACW species <u>45</u>	x 2 = <u>90</u>
FAC species <u>5</u>	x 3 = <u>15</u>
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: <u>60</u> (A)	<u>115</u> (B)
Prevalence Index = B/A = <u>1.92</u>	

**Hydrophytic Vegetation Indicators:**

- ☐ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0<sup>1</sup>
- ☐ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes X No \_\_\_\_\_

Remarks: (include photo numbers here or on a separate sheet.)

W-MCH 9/28/11 - 1a

[illegible]<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Histosol (A1)                        | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) | <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)       |
| <input type="checkbox"/> Histic Epipedon (A2)                 | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)       | <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)     |
| <input type="checkbox"/> Black Histic (A3)                    | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)             | <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                | <input type="checkbox"/> Loamy Gieyed Matrix (F2)                        | <input type="checkbox"/> Dark Surface (S7) (LRR K, L)                |
| <input type="checkbox"/> Stratified Layers (A5)               | <input checked="" type="checkbox"/> Depleted Matrix (F3)                 | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)     |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)    | <input type="checkbox"/> Redox Dark Surface (F6)                         | <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)           |
| <input type="checkbox"/> Thick Dark Surface (A12)             | <input type="checkbox"/> Depleted Dark Surface (F7)                      | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)   |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)             | <input type="checkbox"/> Redox Depressions (F8)                          | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Sandy Gieyed Matrix (S4)             |  | <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)   |
| <input type="checkbox"/> Sandy Redox (S5)                     |  | <input type="checkbox"/> Red Parent Material (TF2)                   |
| <input type="checkbox"/> Stripped Matrix (S6)                 |  | <input type="checkbox"/> Very Shallow Dark Surface (TF12)            |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) |  | <input type="checkbox"/> Other (Explain in Remarks)                  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ~~Yes~~ No

Remarks:

Alt-W 056

W-056 9/28/11-16

## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Beaver Dam Boose Alt Route City/County: Lorain County Sampling Date: 28 Sept 2011  
 Applicant/Owner: First Energy State: OH Sampling Point: 15  
 Investigator(s): M. Thomayer, S. Killebrew UR3 Section, Township, Range: T6N, R19W  
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave  
 Slope (%): \_\_\_\_\_ Lat: 41.395235 Long: -82.268835 Datum: \_\_\_\_\_  
 Soil Map Unit Name: M0 NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No \_\_\_\_\_  
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <u>PRO/DEM wetland located between two existing transmission line ROWs. Part of larger wetland.</u>	

## HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input checked="" type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input checked="" type="checkbox"/> Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input checked="" type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2"</u>		
Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____		
Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>surface</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		

## Remarks:

Saturated throughout with pockets of inundation

VEGETATION – Use scientific names of plants.

W-004 9/28/11 16

Sampling Point: \_\_\_\_\_

Tree Stratum (Plot size: _____)		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1.	Black willow - <i>S. nigra</i>	50	yes	FACW	Number of Dominant Species That Are OBL, FACW, or FAC:	3 (A)
2.	Red maple - <i>A. rubrum</i>	10	no	FAC	Total Number of Dominant Species Across All Strata:	4 (B)
3.					Percent of Dominant Species That Are OBL, FACW, or FAC:	75% (A/B)
4.						
5.						
6.						
7.						
		60 = Total Cover				
		12/30				
Sapling/Shrub Stratum (Plot size: _____)					Prevalence Index worksheet:	
1.	Arrowwood - <i>V. dentatum</i>	5	yes	FAC	Total % Cover of:	Multiply by:
2.	Black willow - <i>S. nigra</i>	10	yes	FACW	OBL species	0 x 1 = 0
3.					FACW species	65 x 2 = 130
4.					FAC species	15 x 3 = 45
5.					FACU species	0 x 4 = 0
6.					UPL species	0 x 5 = 0
7.					Column Totals:	80 (A) 175 (B)
		15 = Total Cover			Prevalence Index = B/A = 2.19	
		3/75				
Herb Stratum (Plot size: _____)					Hydrophytic Vegetation Indicators:	
1.	Japanese stilt grass - <i>M. minimum</i>	80	yes	NI	Rapid Test for Hydrophytic Vegetation	
2.	Immature <i>caudex</i>	5	no	FACW	<input checked="" type="checkbox"/> Dominance Test is >50%	
3.					<input checked="" type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup>	
4.					Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)	
5.					Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
6.					<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
7.					Definitions of Vegetation Strata:	
8.					Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.	
9.					Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.	
10.					Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.	
11.					Woody vines – All woody vines greater than 3.28 ft in height.	
12.						
		85 = Total Cover				
		17/42.5				
Woody Vine Stratum (Plot size: _____)					Hydrophytic Vegetation Present?	
1.	None				Yes <input checked="" type="checkbox"/> No _____	
2.						
3.						
4.						
		0 = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)						

**Sampling Point:**

50-261-9/23/11-10

[illegible]<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Histosol (A1)                        | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) | <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)       |
| <input type="checkbox"/> Histic Epipedon (A2)                 | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)       | <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)     |
| <input type="checkbox"/> Black Histic (A3)                    | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)             | <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                        | <input type="checkbox"/> Dark Surface (S7) (LRR K, L)                |
| <input type="checkbox"/> Stratified Layers (A5)               | <input type="checkbox"/> Depleted Matrix (F3)                            | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)     |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)    | <input type="checkbox"/> Redox Dark Surface (F6)                         | <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)           |
| <input type="checkbox"/> Thick Dark Surface (A12)             | <input type="checkbox"/> Depleted Dark Surface (F7)                      | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)   |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)             | <input type="checkbox"/> Redox Depressions (F8)                          | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)             |  | <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)   |
| <input type="checkbox"/> Sandy Redox (S5)                     |  | <input type="checkbox"/> Red Parent Material (TF2)                   |
| <input type="checkbox"/> Stripped Matrix (S6)                 |  | <input type="checkbox"/> Very Shallow Dark Surface (TF12)            |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) |  | <input type="checkbox"/> Other (Explain in Remarks)                  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Hydric Soil Present? Yes ☒ No ☐

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Remarks:

Alt - W O S a

w- alt 9/27/2011 - 1a

## WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Bever Davis Besse Alt. Route City/County: Lorain County Sampling Date: 27 Sept 2011  
 Applicant/Owner: First Energy State: OH Sampling Point: \_\_\_\_\_  
 Investigator(s): M. Thayer, J. Killaspy, JRS Section, Township, Range: T6N, R19W  
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave  
 Slope (%): \_\_\_\_\_ Lat: 41.391209 Long: -82.268887 Datum: \_\_\_\_\_  
 Soil Map Unit Name: Om NWI classification: n/g

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No \_\_\_\_\_  
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)  
PFO/PSS wetland located between existing powerline ROWs.  
Part of larger wetland

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators (minimum of one is required; check all that apply)</b> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input checked="" type="checkbox"/> Water Marks (B1) <input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<b>Secondary Indicators (minimum of two required)</b> <input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input checked="" type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2"</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>surface</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: <u>Saturated throughout, inundated near drainage swale.</u>		

W-104 9/27/2011-1a

**VEGETATION – Use scientific names of plants.**

Sampling Point: \_\_\_\_\_

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status															
1. Pin oak - <i>Q. palustris</i>	10	no	FACW	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>8</u> (A)  Total Number of Dominant Species Across All Strata: <u>8</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)														
2. Red maple - <i>A. rubrum</i>	30	yes	FAC															
3. Black willow - <i>S. nigra</i>	20	yes	FACW															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____				<b>Prevalence Index worksheet:</b> <table style="width:100%;"> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> <tr> <td>OBL species <u>25</u></td> <td>x 1 = <u>25</u></td> </tr> <tr> <td>FACW species <u>110</u></td> <td>x 2 = <u>220</u></td> </tr> <tr> <td>FAC species <u>65</u></td> <td>x 3 = <u>195</u></td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: <u>200</u></td> <td>(A) <u>340</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.7</u>	Total % Cover of:	Multiply by:	OBL species <u>25</u>	x 1 = <u>25</u>	FACW species <u>110</u>	x 2 = <u>220</u>	FAC species <u>65</u>	x 3 = <u>195</u>	FACU species _____	x 4 = _____	UPL species _____	x 5 = _____	Column Totals: <u>200</u>	(A) <u>340</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>25</u>	x 1 = <u>25</u>																	
FACW species <u>110</u>	x 2 = <u>220</u>																	
FAC species <u>65</u>	x 3 = <u>195</u>																	
FACU species _____	x 4 = _____																	
UPL species _____	x 5 = _____																	
Column Totals: <u>200</u>	(A) <u>340</u> (B)																	
<b>Sapling/Shrub Stratum (Plot size: _____)</b> 1. Redosier dogwood - <i>C. sericea</i> 25 yes FACW 2. Buttonbush - <i>C. occidentalis</i> 15 yes DBL 3. Arrowwood viburnum - <i>V. dentatum</i> 10 no FAC 4. Red maple - <i>A. rubrum</i> 15 yes FAC 5. Black willow - <i>S. nigra</i> 5 no FACW 6. Glossy buckthorn - <i>F. alnus</i> 10 no FAC 7. _____				<b>Hydrophytic Vegetation Indicators:</b> <input checked="" type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> — Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) — Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
<b>Herb Stratum (Plot size: _____)</b> 1. Sandweed - <i>I. scarpensis</i> 15 yes FACW 2. Woolgrass - <i>S. cyperinus</i> 25 yes FACW 3. Common burreed - <i>E. perfoliatum</i> 5 no FACW 4. Polygonum sagittatum 10 no DBL 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____																		
<b>Woody Vine Stratum (Plot size: _____)</b> 1. Riverbank grape - <i>Vitis riparia</i> 5 yes FACW 2. _____ 3. _____ 4. _____					<b>Definitions of Vegetation Strata:</b>  <b>Tree</b> – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/shrub</b> – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vines</b> – All woody vines greater than 3.28 ft in height.													
5 = Total Cover 11/27.5																		
5 = Total Cover					<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No _____													

Remarks: (Include photo numbers here or on a separate sheet.)

PFO primarily along west edge of wetland.

W-Mdt 9/27/2011-1a  
Sampling Point: \_\_\_\_\_

**Sampling Point:**

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) (LRR R, MLRA 149B)

- \_\_\_ Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- \_\_\_ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- \_\_\_ Loamy Mucky Mineral (F1) (LRR K, L)
- \_\_\_ Loamy Gleyed Matrix (F2)
- \_\_\_ Depleted Matrix (F3)
- \_\_\_ Redox Dark Surface (F6)
- \_\_\_ Depleted Dark Surface (F7)
- \_\_\_ Redox Depressions (F8)

- ☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)  
☐ Coast Prairie Redox (A16) (LRR K, L, R)  
☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  
☐ Dark Surface (S7) (LRR K, L)  
☐ Polyvalue Below Surface (S8) (LRR K, L)  
☐ Thin Dark Surface (S9) (LRR K, L)  
☐ Iron-Manganese Masses (F12) (LRR K, L, R)  
☐ Piedmont Floodplain Soils (F19) (MLRA 149B)  
☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)  
☐ Red Parent Material (TF2)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Hydric Soil Present? Yes ☒ No ☐

Type: \_\_\_\_\_

Depth (inches):

Remarks:



Pr - w 28

W2008/11-3

## WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Power Davis Besse: Preferred R4 City/County: Lorain County Sampling Date: 30 Aug 2011  
 Applicant/Owner: First Energy State: OH Sampling Point: \_\_\_\_\_  
 Investigator(s): B. Otto, M. Thomayer Section, Township, Range: T6N, R19W  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): \_\_\_\_\_  
 Slope (%): \_\_\_\_\_ Lat: 41.38722 Long: -82.268292 Datum: \_\_\_\_\_  
 Soil Map Unit Name: M+A NWI classification: 2/9

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation N, Soil Y, or Hydrology Y naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <u>X</u> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)  
PEM/PSS wetland in existing transmission line ROW.

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators (minimum of one is required; check all that apply)</b> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<b>Secondary Indicators (minimum of two required)</b> <input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>Y</u> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes <u>X</u> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: <u>Hydrology seems problematic, but enough indicators were present to satisfy hydrology in wetland</u>		

**VEGETATION** – Use scientific names of plants.

Sampling Point: \_\_\_\_\_

W-620 08/30/11-3

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:														
1. <u>None</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)  Total Number of Dominant Species Across All Strata: <u>5</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)														
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
<u>0</u> = Total Cover				<b>Prevalence Index worksheet:</b> <table style="width: 100%;"> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> <tr> <td>OBL species <u>75</u></td> <td>x 1 = <u>75</u></td> </tr> <tr> <td>FACW species <u>114</u></td> <td>x 2 = <u>228</u></td> </tr> <tr> <td>FAC species <u>17</u></td> <td>x 3 = <u>51</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>206</u> (A)</td> <td><u>354</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.72</u>	Total % Cover of:	Multiply by:	OBL species <u>75</u>	x 1 = <u>75</u>	FACW species <u>114</u>	x 2 = <u>228</u>	FAC species <u>17</u>	x 3 = <u>51</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>206</u> (A)	<u>354</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>75</u>	x 1 = <u>75</u>																	
FACW species <u>114</u>	x 2 = <u>228</u>																	
FAC species <u>17</u>	x 3 = <u>51</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>206</u> (A)	<u>354</u> (B)																	
<u>19</u> = Total Cover <u>3.8 / 9.5</u>																		
Sapling/Shrub Stratum (Plot size: _____)																		
1. <u>glossy buck thorn - Frangula alnus</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>															
2. <u>pin oak - Quercus palustris</u>	<u>5</u>	<u>yes</u>	<u>FACW</u>															
3. <u>cottonwood - Populus deltoides</u>	<u>2</u>	<u>no</u>	<u>FAC</u>															
4. <u>Salix nigra</u>	<u>2</u>	<u>no</u>	<u>FACW</u>															
5. _____																		
6. _____																		
7. _____																		
<u>19</u> = Total Cover <u>3.8 / 9.5</u>																		
Herb Stratum (Plot size: _____)																		
1. <u>Turner ellisus</u>	<u>30</u>	<u>yes</u>	<u>FACW</u>															
2. <u>purple loosestrife - L. salicaria</u>	<u>40</u>	<u>yes</u>	<u>FACW</u>															
3. <u>arrowleaf cattail - T. angustifolia</u>	<u>5</u>	<u>no</u>	<u>OBL</u>															
4. <u>upland rice - Agrostis gigantea</u>	<u>25</u>	<u>no</u>	<u>FACW</u>															
5. <u>Imperata australis</u>	<u>5</u>	<u>no</u>	<u>FACW</u>															
6. <u>Acrois latius - Scirpus pendulus</u>	<u>15</u>	<u>no</u>	<u>OBL</u>															
7. <u>cottonwood - E. pectoliatum</u>	<u>5</u>	<u>no</u>	<u>FACW</u>															
8. <u>Polygonum sagittatum</u>	<u>25</u>	<u>no</u>	<u>OBL</u>															
9. <u>deer tongue</u>	<u>5</u>	<u>no</u>	<u>FAC</u>															
10. <u>roundleaf cottonwood - Solidago patula</u>	<u>30</u>	<u>yes</u>	<u>OBL</u>															
11. <u>polygonum pennsylvanicum</u>	<u>2</u>	<u>no</u>	<u>FACW</u>															
12. _____																		
<u>187</u> = Total Cover <u>37.4 / 93.5</u>																		
Woody Vine Stratum (Plot size: _____)																		
1. <u>None</u>																		
2. _____																		
3. _____																		
4. _____																		
<u>0</u> = Total Cover																		

**Hydrophytic Vegetation Indicators:**  
☒ Rapid Test for Hydrophytic Vegetation  
☒ Dominance Test is >50%  
☒ Prevalence Index is ≤3.0<sup>1</sup>  
☐ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**  
**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  
**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  
**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  
**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

PEM wetland throughout with PSS along east edge.

W-60008/30/11-3  
Sampling Point: \_\_\_\_\_

**Sampling Point:**

[illegible]<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Histosol (A1)                        | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) | <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)       |
| <input type="checkbox"/> Histic Epipedon (A2)                 | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)       | <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)     |
| <input type="checkbox"/> Black Histic (A3)                    | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)             | <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                        | <input type="checkbox"/> Dark Surface (S7) (LRR K, L)                |
| <input type="checkbox"/> Stratified Layers (A5)               | <input checked="" type="checkbox"/> Depleted Matrix (F3)                 | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)     |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)    | <input type="checkbox"/> Redox Dark Surface (F6)                         | <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)           |
| <input type="checkbox"/> Thick Dark Surface (A12)             | <input type="checkbox"/> Depleted Dark Surface (F7)                      | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)   |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)             | <input type="checkbox"/> Redox Depressions (F8)                          | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)             |  | <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)   |
| <input type="checkbox"/> Sandy Redox (S5)                     |  | <input type="checkbox"/> Red Parent Material (TF2)                   |
| <input type="checkbox"/> Stripped Matrix (S6)                 |  | <input type="checkbox"/> Very Shallow Dark Surface (TF12)            |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) |  | <input type="checkbox"/> Other (Explain in Remarks)                  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Type: \_\_\_\_\_

Depth (Inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Took several other soil cores, most of which contained a lot of sand in the top 6".

Att-006

W-1004 4/10/12-5

# WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Avon-Beaver #1 City/County: Corwin Sampling Date: 10 April 2012  
 Applicant/Owner: FirstEnergy State: OH Sampling Point: \_\_\_\_\_  
 Investigator(s): M. Thoma URS Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): \_\_\_\_\_  
 Subregion (LRR or MLRA): \_\_\_\_\_ Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: \_\_\_\_\_ NWI classification: \_\_\_\_\_  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation N Soil N or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation N Soil N or Hydrology N naturally problematic? (If needed, explain any answers in Remarks)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____		
Wetland Hydrology Present?	Yes <u>X</u> No _____	If yes, optional Wetland Site ID	_____
Remarks: (Explain alternative procedures here or in a separate report.) <u>PEM wetland located in scrub/shrub upland area beyond existing ROW.</u>			

## HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required, check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Mud Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Dr. & Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C5)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)	
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes _____ No <u>X</u> Depth (inches): _____		
Water Table Present?	Yes _____ No <u>X</u> Depth (inches): _____		
Saturation Present? (includes capillary fringe)	Yes <u>X</u> No _____ Depth (inches): <u>10"</u>	Wetland Hydrology Present? Yes <u>X</u> No _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections) if available:			
Remarks: <u>Small depressional area that exhibits signs of inundation.</u>			

W-act 4/10/12-5

Sampling Point

[illegible]

\*Location: FI=Fore Using, M=Matrix

### Indicators for Problematic Hydric Soils<sup>2</sup>:

- \_\_\_ Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- \_\_\_ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- \_\_\_ Loamy Mucky Mineral (F1) (LRR K, L)
- \_\_\_ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- \_\_\_ Redox Dark Surface (F5)
- \_\_\_ Depleted Dark Surface (F7)
- \_\_\_ Redox Depressions (F8)

- \_\_\_ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- \_\_\_ Coarse Prairie Redox (A16) (LRR K, L, R)
- \_\_\_ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- \_\_\_ Dark Surface (S7) (LRR K, L, M)
- \_\_\_ Polyvalue Below Surface (S8) (LRR K, L)
- \_\_\_ Thin Dark Surface (S9) (LRR K, L)
- \_\_\_ Iron-Manganese Masses (F12) (LRR K, L, R)
- \_\_\_ Piedmont Floodplain Soils (F19) (MLRA 149B)
- \_\_\_ Mosaic Spodos (TA6) (MLRA 144A, 145, 149B)
- \_\_\_ Red Parent Material (F21)
- \_\_\_ Very Shallow Dark Surface (TF12)
- \_\_\_ Other (Explain in Remarks)

\*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

**APPENDIX B**  
**OHIO EPA WETLAND ORAM FORMS**

Site: **w-mdt051811-2**Rater(s): **mdt**Date: **5/18/2011**

Pr-w01

<b>1</b>	<b>1</b>
max 6 pts	subtotal

**Metric 1. Wetland Area (size).**

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)  
☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)  
☐ 10 to <25 acres (4 to <10.1ha) (4 pts)  
☐ 3 to <10 acres (1.2 to <4ha) (3 pts)  
☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)  
☒ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)  
☐ <0.1 acres (0.04ha) (0 pts)

<b>2</b>	<b>3</b>
max 14 pts	subtotal

**Metric 2. Upland buffers and surrounding land use.**

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)  
☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)  
☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)  
☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)  
☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)  
☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)  
☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

<b>16</b>	<b>19</b>
max 30 pts	subtotal

**Metric 3. Hydrology.**

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)  
☐ Other groundwater (3)  
☒ Precipitation (1)  
☒ Seasonal/Intermittent surface water (3)  
☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- ☐ >0.7 (27.6in) (3)  
☐ 0.4 to 0.7m (15.7 to 27.6in) (2)  
☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)  
☒ Recovered (7)  
☐ Recovering (3)  
☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)  
☐ Between stream/lake and other human use (1)  
☒ Part of wetland/upland (e.g. forest), complex (1)  
☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)  
☐ Regularly inundated/saturated (3)  
☒ Seasonally inundated (2)  
☒ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input type="checkbox"/> ditch            | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile             | <input checked="" type="checkbox"/> filling/grading   |
| <input type="checkbox"/> dike             | <input type="checkbox"/> road bed/RR track            |
| <input type="checkbox"/> weir             | <input type="checkbox"/> dredging                     |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other:                       |

<b>8</b>	<b>27</b>
max 20 pts	subtotal

**Metric 4. Habitat Alteration and Development.**

4a. Substrate disturbance. Score one or double check and average.

- ☒ None or none apparent (4)  
☐ Recovered (3)  
☐ Recovering (2)  
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)  
☐ Very good (6)  
☐ Good (5)  
☐ Moderately good (4)  
☐ Fair (3)  
☐ Poor to fair (2)  
☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)  
☐ Recovered (7)  
☒ Recovering (3)  
☐ Recent or no recovery (1)

Check all disturbances observed

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> mowing               | <input checked="" type="checkbox"/> shrub/sapling removal          |
| <input type="checkbox"/> grazing                         | <input checked="" type="checkbox"/> herbaceous/aquatic bed removal |
| <input checked="" type="checkbox"/> clearcutting         | <input checked="" type="checkbox"/> sedimentation                  |
| <input checked="" type="checkbox"/> selective cutting    | <input type="checkbox"/> dredging                                  |
| <input checked="" type="checkbox"/> woody debris removal | <input type="checkbox"/> farming                                   |
| <input type="checkbox"/> toxic pollutants                | <input type="checkbox"/> nutrient enrichment                       |



Subtotal this page

Site: **w-mdt051811-2** Rater(s): **mdt** Date: **5/18/2011**

**1**

Subtotal this page

**0** **0**

max 10 pts

subtotal

## Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Praires (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

**1** **1**

max 20 pts

subtotal

## Metric 6. Plant communities, interspersions, microtopography.

### 6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open Water
- ☐ Other

### 6b. horizontal (plan view) Interspersions.

Select only one.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☒ None (0)

### 6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage

- ☒ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

### 6d. Microtopography.

Score all present using 0 to 3 scale.

- ☒ Vegetated hummocks/tussucks
- ☐ Coarse woody debris >15cm (6in)
- ☐ Standing dead >25cm (10in) dbh
- ☒ Amphibian breeding pools

### Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

### Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

### Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

### Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

**26**

**GRAND TOTAL(max 100 pts)**

Category: **1**



Pr-w 02

Site: w-mdt051811-3

Rater(s): mdt

Date: 5/18/2011

1	1
max 6 pts	subtotal

### Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☒ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☐ <0.1 acres (0.04ha) (0 pts)

1	2
max 14 pts	subtotal

### Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

13	15
max 30 pts	subtotal

### Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☒ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or double check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☒ Seasonally inundated (2)
- ☒ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input type="checkbox"/> ditch            | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile             | <input checked="" type="checkbox"/> filling/grading   |
| <input type="checkbox"/> dike             | <input type="checkbox"/> road bed/RR track            |
| <input type="checkbox"/> weir             | <input type="checkbox"/> dredging                     |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other:                       |

8	23
max 20 pts	subtotal

### Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☒ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> mowing               | <input checked="" type="checkbox"/> shrub/sapling removal          |
| <input type="checkbox"/> grazing                         | <input checked="" type="checkbox"/> herbaceous/aquatic bed removal |
| <input checked="" type="checkbox"/> clearcutting         | <input checked="" type="checkbox"/> sedimentation                  |
| <input checked="" type="checkbox"/> selective cutting    | <input type="checkbox"/> dredging                                  |
| <input checked="" type="checkbox"/> woody debris removal | <input type="checkbox"/> farming                                   |
| <input type="checkbox"/> toxic pollutants                | <input type="checkbox"/> nutrient enrichment                       |

23
Subtotal this page

Site: **w-mdt051811-3** Rater(s): **mdt** Date: **5/18/2011**

**1**

Subtotal this page

**0** **0**

max 10 pts

subtotal

### Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

**1** **1**

max 20 pts

subtotal

### Metric 6. Plant communities, interspersions, microtopography.

#### 6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open Water
- ☐ Other

#### 6b. horizontal (plan view) interspersions.

Select only one.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☒ None (0)

#### 6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☒ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

#### 6d. Microtopography.

Score all present using 0 to 3 scale.

- ☒ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15cm (6in)
- ☐ Standing dead >25cm (10in) dbh
- ☒ Amphibian breeding pools

#### Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

#### Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

#### Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

#### Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

**24** GRAND TOTAL(max 100 pts)

Category: **1**

Site: w-mdt051811-4

Rater(s): mdt

Date: 5/18/2011

2	2
max 6 pts	subtotal

### Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☒ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☐ <0.1 acres (0.04ha) (0 pts)

1	3
max 14 pts	subtotal

### Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

13	16
max 30 pts	subtotal

### Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☒ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☒ Seasonally inundated (2)
- ☒ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input type="checkbox"/> ditch            | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile             | <input checked="" type="checkbox"/> filling/grading   |
| <input type="checkbox"/> dike             | <input checked="" type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir             | <input type="checkbox"/> dredging                     |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other:                       |

7	23
max 20 pts	subtotal

### Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☒ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> mowing               | <input checked="" type="checkbox"/> shrub/sapling removal          |
| <input type="checkbox"/> grazing                         | <input checked="" type="checkbox"/> herbaceous/aquatic bed removal |
| <input checked="" type="checkbox"/> clearcutting         | <input checked="" type="checkbox"/> sedimentation                  |
| <input checked="" type="checkbox"/> selective cutting    | <input type="checkbox"/> dredging                                  |
| <input checked="" type="checkbox"/> woody debris removal | <input type="checkbox"/> farming                                   |
| <input type="checkbox"/> toxic pollutants                | <input type="checkbox"/> nutrient enrichment                       |

23
Subtotal this page

Site: **w-mdt051811-4**Rater(s): **mdt**Date: **5/18/2011****2**

Subtotal this page

**0**

max 10 pts

**0**

subtotal

**Metric 5. Special Wetlands.**

Check all that apply and score as indicated.

- ☐ Bog (10)  
☐ Fen (10)  
☐ Old growth forest (10)  
☐ Mature forested wetland (5)  
☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)  
☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)  
☐ Lake Plain Sand Prairies (Oak Openings) (10)  
☐ Relict Wet Prairies (10)  
☐ Known occurrence state/federal threatened or endangered species (10)  
☐ Significant migratory songbird/water fowl habitat or usage (10)  
☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

**2**

max 20 pts

**2**

subtotal

**Metric 6. Plant communities, interspersions, microtopography.****6a. Wetland Vegetation Communities.**

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed  
☒ 2 Emergent  
☐ 0 Shrub  
☐ 0 Forest  
☐ 0 Mudflats  
☐ 0 Open Water  
☐ Other

**6b. horizontal (plan view) Interspersion.**

Select only one.

- ☐ High (5)  
☐ Moderately high(4)  
☐ Moderate (3)  
☐ Moderately low (2)  
☐ Low (1)  
☒ None (0)

**6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage**

- ☐ Extensive >75% cover (-5)  
☒ Moderate 25-75% cover (-3)  
☐ Sparse 5-25% cover (-1)  
☐ Nearly absent <5% cover (0)  
☐ Absent (1)

**6d. Microtopography.**

Score all present using 0 to 3 scale.

- ☒ 1 Vegetated hummocks/tussocks  
☐ 0 Coarse woody debris >15cm (6in)  
☐ 0 Standing dead >25cm (10in) dbh  
☒ 2 Amphibian breeding pools

**Vegetation Community Cover Scale**

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

**Narrative Description of Vegetation Quality**

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

**Mudflat and Open Water Class Quality**

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

**Microtopography Cover Scale**

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

**25****GRAND TOTAL(max 100 pts)**Category: **di**

Alt - w01

Site: w-mdt08/3/11-3 Rater(s): mdt Date: 8/31/2011

0	0
max 6 pts	subtotal

### Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☒ <0.1 acres (0.04ha) (0 pts)

4	4
max 14 pts	subtotal

### Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☒ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- ☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

16	20
max 30 pts	subtotal

### Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☒ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☒ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☐ Seasonally inundated (2)
- ☒ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input type="checkbox"/> ditch            | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile             | <input checked="" type="checkbox"/> filling/grading   |
| <input type="checkbox"/> dike             | <input checked="" type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir             | <input type="checkbox"/> dredging                     |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other:                       |

7	27
max 20 pts	subtotal

### Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☒ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> mowing               | <input type="checkbox"/> shrub/sapling removal          |
| <input type="checkbox"/> grazing                         | <input type="checkbox"/> herbaceous/aquatic bed removal |
| <input type="checkbox"/> clearcutting                    | <input type="checkbox"/> sedimentation                  |
| <input type="checkbox"/> selective cutting               | <input type="checkbox"/> dredging                       |
| <input checked="" type="checkbox"/> woody debris removal | <input type="checkbox"/> farming                        |
| <input type="checkbox"/> toxic pollutants                | <input type="checkbox"/> nutrient enrichment            |

27
----

Subtotal this page

Site: **w-mdt08/31/11-3** Rater(s): **mdt** Date: **8/31/2011**

**4**

Subtotal this page

**0**

max 10 pts

**0**

subtotal

## Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

**4**

max 20 pts

**4**

subtotal

## Metric 6. Plant communities, interspersions, microtopography.

### 6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open Water
- ☐ Other

### 6b. horizontal (plan view) Interspersions.

Select only one.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☒ None (0)

### 6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☒ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

### 6d. Microtopography.

Score all present using 0 to 3 scale.

- ☒ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15cm (6in)
- ☐ Standing dead >25cm (10in) dbh
- ☐ Amphibian breeding pools

### Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

### Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

### Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

### Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

**31**

**GRAND TOTAL(max 100 pts)**

Category: **2**

Alt - w02

Site: w-bao91511-5	Rater(s): mdt	Date: 9/15/2011
--------------------	---------------	-----------------

<b>0</b>	<b>0</b>
max 6 pts	subtotal

### Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☒ <0.1 acres (0.04ha) (0 pts)

<b>2</b>	<b>2</b>
max 14 pts	subtotal

### Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- ☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

<b>13</b>	<b>15</b>
max 30 pts	subtotal

### Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☒ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☒ Seasonally inundated (2)
- ☒ Seasonally saturated in upper 30cm (12in) (1)

Score one or double check and average.

Check all disturbances observed

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile             | <input checked="" type="checkbox"/> filling/grading   |
| <input type="checkbox"/> dike             | <input checked="" type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir             | <input type="checkbox"/> dredging                     |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other:                       |

<b>8</b>	<b>23</b>
max 20 pts	subtotal

### Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☒ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> mowing            | <input type="checkbox"/> shrub/sapling removal          |
| <input type="checkbox"/> grazing                      | <input type="checkbox"/> herbaceous/aquatic bed removal |
| <input checked="" type="checkbox"/> clearcutting      | <input checked="" type="checkbox"/> sedimentation       |
| <input checked="" type="checkbox"/> selective cutting | <input type="checkbox"/> dredging                       |
| <input type="checkbox"/> woody debris removal         | <input type="checkbox"/> farming                        |
| <input type="checkbox"/> toxic pollutants             | <input type="checkbox"/> nutrient enrichment            |

<b>23</b>
Subtotal this page

Site: <b>w-bao91511-5</b>	Rater(s): <b>mdt</b>	Date: <b>9/15/2011</b>
---------------------------	----------------------	------------------------

7

Subtotal this page

0	0
max 10 pts	subtotal

### Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

7	7
max 20 pts	subtotal

### Metric 6. Plant communities, interspersions, microtopography.

#### 6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 3 Emergent
- ☐ 1 Shrub
- ☐ 1 Forest
- ☐ 0 Mudflats
- ☐ 0 Open Water
- ☐ Other \_\_\_\_\_

#### 6b. horizontal (plan view)

##### Interspersions.

Select only one.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☒ Low (1)
- ☐ None (0)

#### 6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☒ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

#### 6d. Microtopography.

Score all present using 0 to 3 scale.

- ☐ 2 Vegetated hummocks/tussocks
- ☐ 1 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 1 Amphibian breeding pools

#### Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

#### Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

#### Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

#### Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

**30**

**GRAND TOTAL(max 100 pts)**

Category: **2**



Alt - w 03

Site: w-bao91511-4

Rater(s): mdt

Date: 9/15/2011

0

max 6 pts

0

subtotal

**Metric 1. Wetland Area (size).**

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)  
☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)  
☐ 10 to <25 acres (4 to <10.1ha) (4 pts)  
☐ 3 to <10 acres (1.2 to <4ha) (3 pts)  
☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)  
☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)  
☒ <0.1 acres (0.04ha) (0 pts)

1

max 14 pts

1

subtotal

**Metric 2. Upland buffers and surrounding land use.**

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)  
☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)  
☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)  
☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)  
☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)  
☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)  
☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

13

max 30 pts

14

subtotal

**Metric 3. Hydrology.**

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)  
☐ Other groundwater (3)  
☒ Precipitation (1)  
☐ Seasonal/Intermittent surface water (3)  
☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- ☐ >0.7 (27.6in) (3)  
☐ 0.4 to 0.7m (15.7 to 27.6in) (2)  
☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)  
☒ Recovered (7)  
☐ Recovering (3)  
☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)  
☐ Between stream/lake and other human use (1)  
☐ Part of wetland/upland (e.g. forest), complex (1)  
☒ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)  
☒ Regularly inundated/saturated (3)  
☐ Seasonally inundated (2)  
☐ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- ☒ ditch  
☐ tile  
☐ dike  
☐ weir  
☐ stormwater input  
☐ point source (nonstormwater)  
☒ filling/grading  
☒ road bed/RR track  
☐ dredging  
☐ Other:

11

max 20 pts

25

subtotal

**Metric 4. Habitat Alteration and Development.**

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)  
☒ Recovered (3)  
☐ Recovering (2)  
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)  
☐ Very good (6)  
☐ Good (5)  
☐ Moderately good (4)  
☐ Fair (3)  
☐ Poor to fair (2)  
☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)  
☒ Recovered (7)  
☐ Recovering (3)  
☐ Recent or no recovery (1)

Check all disturbances observed

- ☒ mowing  
☐ grazing  
☒ clearcutting  
☒ selective cutting  
☐ woody debris removal  
☐ toxic pollutants  
☐ shrub/sapling removal  
☐ herbaceous/aquatic bed removal  
☒ sedimentation  
☐ dredging  
☐ farming  
☐ nutrient enrichment

25

Subtotal this page

Site: **w-bao91511-4** Rater(s): **mdt** Date: **9/15/2011**

**6**

Subtotal this page

**0**

max 10 pts

**0**

subtotal

### Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

**6**

max 20 pts

**6**

subtotal

### Metric 6. Plant communities, interspersions, microtopography.

#### 6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 3 Emergent
- ☐ 1 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open Water
- ☐ Other

#### 6b. horizontal (plan view) Interspersions.

Select only one.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☒ Low (1)
- ☐ None (0)

#### 6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☒ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

#### 6d. Microtopography.

Score all present using 0 to 3 scale.

- ☒ 2 Vegetated hummocks/tussocks
- ☒ 1 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☒ 1 Amphibian breeding pools

#### Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

#### Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

#### Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

#### Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

**31**

**GRAND TOTAL(max 100 pts)**

Category: **2**

Alt - w046

Site: w-md9/27/2011-1b Rater(s): mdt Date: 9/27/2011

1	1
max 6 pts	subtotal

**Metric 1. Wetland Area (size).**

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)  
☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)  
☐ 10 to <25 acres (4 to <10.1ha) (4 pts)  
☐ 3 to <10 acres (1.2 to <4ha) (3 pts)  
☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)  
☒ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)  
☐ <0.1 acres (0.04ha) (0 pts)

3	4
max 14 pts	subtotal

**Metric 2. Upland buffers and surrounding land use.**

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)  
☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)  
☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)  
☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)  
☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)  
☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)  
☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

11	15
max 30 pts	subtotal

**Metric 3. Hydrology.**

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)  
☐ Other groundwater (3)  
☒ Precipitation (1)  
☐ Seasonal/Intermittent surface water (3)  
☐ Perennial surface water (lake or stream) (5)  
**3c. Maximum water depth. Select one.**  
☐ >0.7 (27.6in) (3)  
☐ 0.4 to 0.7m (15.7 to 27.6in) (2)  
☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)  
☒ Recovered (7)  
☒ Recovering (3)  
☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)  
☐ Between stream/lake and other human use (1)  
☐ Part of wetland/upland (e.g. forest), complex (1)  
☒ Part of riparian or upland corridor (1)  
**3d. Duration inundation/saturation. Score one or dbl check.**  
☐ Semi- to permanently inundated/saturated (4)  
☐ Regularly inundated/saturated (3)  
☒ Seasonally inundated (2)  
☒ Seasonally saturated in upper 30cm (12in) (1)

Score one or double check and average.

Check all disturbances observed

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile             | <input checked="" type="checkbox"/> filling/grading   |
| <input type="checkbox"/> dike             | <input checked="" type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir             | <input type="checkbox"/> dredging                     |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other:                       |

8	23
max 20 pts	subtotal

**Metric 4. Habitat Alteration and Development.**

4a. Substrate disturbance. Score one or double check and average.

- ☒ None or none apparent (4)  
☐ Recovered (3)  
☐ Recovering (2)  
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)  
☐ Very good (6)  
☐ Good (5)  
☐ Moderately good (4)  
☐ Fair (3)  
☐ Poor to fair (2)  
☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)  
☐ Recovered (7)  
☒ Recovering (3)  
☐ Recent or no recovery (1)

Check all disturbances observed

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> mowing               | <input checked="" type="checkbox"/> shrub/sapling removal |
| <input type="checkbox"/> grazing                         | <input type="checkbox"/> herbaceous/aquatic bed removal   |
| <input checked="" type="checkbox"/> clearcutting         | <input type="checkbox"/> sedimentation                    |
| <input checked="" type="checkbox"/> selective cutting    | <input type="checkbox"/> dredging                         |
| <input checked="" type="checkbox"/> woody debris removal | <input type="checkbox"/> farming                          |
| <input type="checkbox"/> toxic pollutants                | <input type="checkbox"/> nutrient enrichment              |

23
----

Subtotal this page

Site: **w-mdt9/27/2011-1b** Rater(s): **mdt** Date: **9/27/2011**

**4**

Subtotal this page

**0**

max 10 pts

**0**

subtotal

## Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

**4**

max 20 pts

**4**

subtotal

## Metric 6. Plant communities, interspersions, microtopography.

### 6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 3 Emergent
- ☒ 1 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open Water
- ☐ Other

### 6b. horizontal (plan view) Interspersion.

Select only one.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☒ Low (1)
- ☐ None (0)

### 6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☒ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

### 6d. Microtopography.

Score all present using 0 to 3 scale.

- ☒ 1 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☒ 1 Amphibian breeding pools

### Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

### Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

### Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

### Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

**27**

**GRAND TOTAL(max 100 pts)**

Category: **1**

Site: w-mdt9/28/11-1a

Rater(s): mdt

Date: 9/28/2011

2

max 6 pts

2

subtotal

**Metric 1. Wetland Area (size).**

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☒ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☐ <0.1 acres (0.04ha) (0 pts)

3

max 14 pts

5

subtotal

**Metric 2. Upland buffers and surrounding land use.**

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- ☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

9

max 30 pts

14

subtotal

**Metric 3. Hydrology.**

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☒ Part of wetland/upland (e.g. forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☐ Seasonally inundated (2)
- ☒ Seasonally saturated in upper 30cm (12in) (1)

Score one or double check and average.

Check all disturbances observed

- ☒ ditch
- ☐ tile
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ Other:

8

max 20 pts

22

subtotal

**Metric 4. Habitat Alteration and Development.**

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☒ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☒ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☒ mowing
- ☐ grazing
- ☒ clearcutting
- ☒ selective cutting
- ☐ woody debris removal
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ sedimentation
- ☐ dredging
- ☐ farming
- ☐ nutrient enrichment

22

Subtotal this page

Site: <b>w-mdt9/28/11-1a</b>	Rater(s): <b>mdt</b>	Date: <b>9/28/2011</b>
------------------------------	----------------------	------------------------

7

Subtotal this page

0	0
max 10 pts	subtotal

### Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Praires (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

7	7
max 20 pts	subtotal

### Metric 6. Plant communities, interspersions, microtopography.

#### 6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 3 Emergent
- ☐ 2 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open Water
- ☐ Other \_\_\_\_\_

#### 6b. horizontal (plan view) Interspersions.

Select only one.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☒ x Moderately low (2)
- ☐ Low (1)
- ☐ None (0)

#### 6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☒ x Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

#### 6d. Microtopography.

Score all present using 0 to 3 scale.

- ☒ 2 Vegetated hummocks/tussucks
- ☒ 1 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

#### Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

#### Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

#### Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

#### Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

29

**GRAND TOTAL(max 100 pts)**

Category: **1**

Alt - WDS6

Site: <b>w-mdt9/28/11-1b</b>	Rater(s): <b>mdt</b>	Date: <b>9/28/2011</b>
------------------------------	----------------------	------------------------

<b>2</b>	<b>2</b>
max 6 pts	subtotal

**Metric 1. Wetland Area (size).**

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☒ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☐ <0.1 acres (0.04ha) (0 pts)

<b>4</b>	<b>6</b>
max 14 pts	subtotal

**Metric 2. Upland buffers and surrounding land use.**

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☒ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- ☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

<b>11</b>	<b>17</b>
max 30 pts	subtotal

**Metric 3. Hydrology.**

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☒ Part of wetland/upland (e.g. forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☐ Seasonally inundated (2)
- ☒ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> ditch</li> <li><input type="checkbox"/> tile</li> <li><input type="checkbox"/> dike</li> <li><input type="checkbox"/> weir</li> <li><input type="checkbox"/> stormwater input</li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> point source (nonstormwater)</li> <li><input type="checkbox"/> filling/grading</li> <li><input type="checkbox"/> road bed/RR track</li> <li><input type="checkbox"/> dredging</li> <li><input type="checkbox"/> Other:</li> </ul> |
|---|---|

<b>15</b>	<b>32</b>
max 20 pts	subtotal

**Metric 4. Habitat Alteration and Development.**

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☒ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☒ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> mowing</li> <li><input type="checkbox"/> grazing</li> <li><input checked="" type="checkbox"/> clearcutting</li> <li><input checked="" type="checkbox"/> selective cutting</li> <li><input type="checkbox"/> woody debris removal</li> <li><input type="checkbox"/> toxic pollutants</li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> shrub/sapling removal</li> <li><input type="checkbox"/> herbaceous/aquatic bed removal</li> <li><input type="checkbox"/> sedimentation</li> <li><input type="checkbox"/> dredging</li> <li><input type="checkbox"/> farming</li> <li><input type="checkbox"/> nutrient enrichment</li> </ul> |
|---|--|

<b>32</b>
Subtotal this page

Site: **w-mdt9/28/11-1b**

Rater(s): **mdt**

Date: **9/28/2011**

**7**

Subtotal this page

**0**

max 10 pts

**0**

subtotal

### Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

**7**

max 20 pts

**7**

subtotal

### Metric 6. Plant communities, interspersions, microtopography.

#### 6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open Water
- ☐ Other

#### 6b. horizontal (plan view)

##### Interspersions.

Select only one.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☒ Moderately low (2)
- ☐ Low (1)
- ☐ None (0)

#### 6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☒ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

#### 6d. Microtopography.

Score all present using 0 to 3 scale.

- ☒ Vegetated hummocks/tussocks
- ☒ Coarse woody debris >15cm (6in)
- ☐ Standing dead >25cm (10in) dbh
- ☐ Amphibian breeding pools

#### Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

#### Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

#### Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

#### Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

**39**

**GRAND TOTAL(max 100 pts)**

Category: **2**



Site: w-mdt9/27/2011-1a Rater(s): mdt Date: 9/27/2011

<b>1</b>	<b>1</b>
max 6 pts	subtotal

### Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☒ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☐ <0.1 acres (0.04ha) (0 pts)

<b>3</b>	<b>4</b>
max 14 pts	subtotal

### Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- ☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

<b>11</b>	<b>15</b>
max 30 pts	subtotal

### Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☒ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☒ Seasonally inundated (2)
- ☒ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile             | <input checked="" type="checkbox"/> filling/grading   |
| <input type="checkbox"/> dike             | <input checked="" type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir             | <input type="checkbox"/> dredging                     |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other:                       |

<b>13</b>	<b>28</b>
max 20 pts	subtotal

### Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☒ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☒ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input type="checkbox"/> mowing                       | <input type="checkbox"/> shrub/sapling removal          |
| <input type="checkbox"/> grazing                      | <input type="checkbox"/> herbaceous/aquatic bed removal |
| <input type="checkbox"/> clearcutting                 | <input type="checkbox"/> sedimentation                  |
| <input checked="" type="checkbox"/> selective cutting | <input type="checkbox"/> dredging                       |
| <input type="checkbox"/> woody debris removal         | <input type="checkbox"/> farming                        |
| <input type="checkbox"/> toxic pollutants             | <input type="checkbox"/> nutrient enrichment            |

<b>28</b>
Subtotal this page

Site: **w-mdt9/27/2011-1a** Rater(s): **mdt** Date: **9/27/2011**

**8**

Subtotal this page

**0**

max 10 pts

**0**

subtotal

## Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

**8**

max 20 pts

**8**

subtotal

## Metric 6. Plant communities, interspersions, microtopography.

### 6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☒ 1 Emergent
- ☐ 2 Shrub
- ☐ 2 Forest
- ☐ 0 Mudflats
- ☐ 0 Open Water
- ☐ Other

### 6b. horizontal (plan view) Interspersions.

Select only one.

- ☐ High (5)
- ☐ Moderately high(4)
- ☒ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☐ None (0)

### 6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☒ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

### 6d. Microtopography.

Score all present using 0 to 3 scale.

- ☒ 1 Vegetated hummocks/tussocks
- ☒ 1 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☒ 1 Amphibian breeding pools

### Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

### Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

### Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

### Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

**36**

**GRAND TOTAL(max 100 pts)**

Category: **2**

Site: w-bao-083011-03

Rater(s): bao

Date: 8/30/2011

Pr-w 28

1	1
max 6 pts	subtotal

**Metric 1. Wetland Area (size).**

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)  
☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)  
☐ 10 to <25 acres (4 to <10.1ha) (4 pts)  
☐ 3 to <10 acres (1.2 to <4ha) (3 pts)  
☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)  
☒ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)  
☐ <0.1 acres (0.04ha) (0 pts)

1	2
max 14 pts	subtotal

**Metric 2. Upland buffers and surrounding land use.**

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)  
☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)  
☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)  
☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)  
☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)  
☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)  
☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

8	10
max 30 pts	subtotal

**Metric 3. Hydrology.**

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)  
☐ Other groundwater (3)  
☒ Precipitation (1)  
☐ Seasonal/Intermittent surface water (3)  
☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- ☐ >0.7 (27.6in) (3)  
☐ 0.4 to 0.7m (15.7 to 27.6in) (2)  
☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)  
☒ Recovered (7)  
☒ Recovering (3)  
☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)  
☐ Between stream/lake and other human use (1)  
☐ Part of wetland/upland (e.g. forest), complex (1)  
☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)  
☐ Regularly inundated/saturated (3)  
☐ Seasonally inundated (2)  
☒ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input type="checkbox"/> ditch            | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile             | <input type="checkbox"/> filling/grading              |
| <input type="checkbox"/> dike             | <input type="checkbox"/> road bed/RR track            |
| <input type="checkbox"/> weir             | <input type="checkbox"/> dredging                     |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other:                       |

11	21
max 20 pts	subtotal

**Metric 4. Habitat Alteration and Development.**

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)  
☒ Recovered (3)  
☒ Recovering (2)  
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)  
☐ Very good (6)  
☐ Good (5)  
☐ Moderately good (4)  
☒ Fair (3)  
☐ Poor to fair (2)  
☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (12)  
☒ Recovered (7)  
☒ Recovering (3)  
☐ Recent or no recovery (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> mowing    | <input checked="" type="checkbox"/> shrub/sapling removal |
| <input type="checkbox"/> grazing              | <input type="checkbox"/> herbaceous/aquatic bed removal   |
| <input type="checkbox"/> clearcutting         | <input type="checkbox"/> sedimentation                    |
| <input type="checkbox"/> selective cutting    | <input type="checkbox"/> dredging                         |
| <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming                          |
| <input type="checkbox"/> toxic pollutants     | <input type="checkbox"/> nutrient enrichment              |

21
----

Subtotal this page

Site: <b>w-bao-083011-03</b>	Rater(s): <b>bao</b>	Date: <b>8/30/2011</b>
------------------------------	----------------------	------------------------

1

Subtotal this page

0

max 10 pts

0

subtotal

## Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 5 Qualitative Rating (-10)

1

max 20 pts

1

subtotal

## Metric 6. Plant communities, interspersions, microtopography.

### 6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- 0

 Aquatic bed
- 1

 Emergent
- 1

 Shrub
- 0

 Forest
- 0

 Mudflats
- 0

 Open Water
- Other

### 6b. horizontal (plan view)

#### Interspersions.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- x

 Moderately low (2)
- Low (1)
- None (0)

### 6c. Coverage of invasive plants. Refer Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- x

 Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

### 6d. Microtopography.

Score all present using 0 to 3 scale.

- 0

 Vegetated hummocks/tussocks
- 0

 Coarse woody debris >15cm (6in)
- 0

 Standing dead >25cm (10in) dbh
- 0

 Amphibian breeding pools

### Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

### Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

### Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

### Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

22

**GRAND TOTAL(max 100 pts)**

Category:

Alt-WD6  
Wtndt 4/10/12-5

<b>Site:</b> Beaver Davis Besse NC	<b>Rater(s):</b> M. Thompson	<b>URS</b>	<b>Date:</b> 10 April 2012
------------------------------------	------------------------------	------------	----------------------------

0	0
max 6 pts.	subtotal

### Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☒ <0.1 acres (0.04ha) (0 pts)

3	3
max 14 pts.	subtotal

### Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☒ LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

13	16
max 30 pts.	subtotal

### Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)
- ☒ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☒ Seasonally inundated (2)
- ☒ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input type="checkbox"/> ditch            | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile             | <input type="checkbox"/> filling/grading              |
| <input type="checkbox"/> dike             | <input type="checkbox"/> road bed/RR track            |
| <input type="checkbox"/> weir             | <input type="checkbox"/> dredging                     |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> other                        |

8	24
max 20 pts.	subtotal

### Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☒ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☒ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input type="checkbox"/> mowing               | <input checked="" type="checkbox"/> shrub/sapling removal |
| <input type="checkbox"/> grazing              | <input type="checkbox"/> herbaceous/aquatic bed removal   |
| <input type="checkbox"/> clearcutting         | <input type="checkbox"/> sedimentation                    |
| <input type="checkbox"/> selective cutting    | <input checked="" type="checkbox"/> dredging              |
| <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming                          |
| <input type="checkbox"/> toxic pollutants     | <input type="checkbox"/> nutrient enrichment              |

24
subtotal this page

HH-006  
W-MCH 4/10/12-5

Site: Beaver Davis Besse AIC Rater(s): M. Thompson URS Date: 10 April 2012

24  
subtotal first page

0 24  
max 10 pts. subtotal

### Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- 0
- ☐ Bog (10)
  - ☐ Fen (10)
  - ☐ Old growth forest (10)
  - ☐ Mature forested wetland (5)
  - ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
  - ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
  - ☐ Lake Plain Sand Prairies (Oak Openings) (10)
  - ☐ Relict Wet Prairies (10)
  - ☐ Known occurrence state/federal threatened or endangered species (10)
  - ☐ Significant migratory songbird/water fowl habitat or usage (10)
  - ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

5 29  
max 20 pts. subtotal

### Metric 6. Plant communities, interspersions, microtopography.

#### 6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- 3
- ☐ Aquatic bed
  - ☒ Emergent
  - ☐ Shrub
  - ☐ Forest
  - ☐ Mudflats
  - ☐ Open water
  - ☐ Other

#### 6b. horizontal (plan view) Interspersion.

Select only one.

- 1
- ☐ High (5)
  - ☐ Moderately high (4)
  - ☐ Moderate (3)
  - ☐ Moderately low (2)
  - ☒ Low (1)
  - ☐ None (0)

#### 6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- 1
- ☐ Extensive >75% cover (-5)
  - ☐ Moderate 25-75% cover (-3)
  - ☒ Sparse 5-25% cover (-1)
  - ☐ Nearly absent <5% cover (0)
  - ☐ Absent (1)

#### 6d. Microtopography.

Score all present using 0 to 3 scale.

- 2
- ☒ Vegetated hummocks/tussocks
  - ☐ Coarse woody debris >15cm (6in)
  - ☐ Standing dead >25cm (10in) dbh
  - ☐ Amphibian breeding pools

#### Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

#### Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

#### Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

#### Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

Category  
I

29

End of Quantitative Rating. Complete Categorization Worksheets.

**APPENDIX C**  
**OHIO EPA QHEI STREAM FORMS**

Stream & Location: CE BDB ALTERNATE ROUTE RM: --- Date: 09/31/11

Scorers Full Name & Affiliation: Brian O'Leary, URS  
River Code: --- STORET #: --- Lat./Long.: 18 Office verified location ☐

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

BEST TYPES		OTHER TYPES		ORIGIN		QUALITY	
<input type="checkbox"/> BLDR/SLABS [10]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT	<input type="checkbox"/> HEAVY [-2]	<input type="checkbox"/> MODERATE [-1]
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> TILLS [1]	<input type="checkbox"/> WETLANDS [0]	<input checked="" type="checkbox"/> NORMAL [0]	<input type="checkbox"/> FREE [1]
<input type="checkbox"/> COBBLE [8]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> EXTENSIVE [-2]	<input type="checkbox"/> MODERATE [-1]
<input type="checkbox"/> GRAVEL [7]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> SILT [2]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> LACUSTURINE [0]	<input checked="" type="checkbox"/> NORMAL [0]	<input type="checkbox"/> NONE [1]
<input type="checkbox"/> SAND [6]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> POOL RIFFLE	<input checked="" type="checkbox"/> SHALE [-1]	<input type="checkbox"/> COAL FINES [-2]		
<input checked="" type="checkbox"/> BEDROCK [5]	<u>80</u> <u>90</u>	(Score natural substrates; ignore sludge from point-sources)					

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

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.

AMOUNT	
<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70cm [2]
<input checked="" type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]
<input checked="" type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]
<input type="checkbox"/> ROOTMATS [1]	<input type="checkbox"/> LOGS OR WOODY DEBRIS [1]

Check ONE (Or 2 & average)

☐ EXTENSIVE >75% [11]

☒ MODERATE 25-75% [7]

☐ SPARSE 5-25% [3]

☐ NEARLY ABSENT <5% [1]

Comments

Cover Maximum 20 **12**

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

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input checked="" type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]
<input checked="" type="checkbox"/> MODERATE [3]	<input checked="" type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]
<input type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [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)

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY	
<input type="checkbox"/> NONE / LITTLE [3]	<input checked="" type="checkbox"/> MODERATE [2]	<input checked="" type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> MODERATE 10-50m [3]	<input checked="" type="checkbox"/> FOREST, SWAMP [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]
<input checked="" type="checkbox"/> MODERATE [2]	<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> FENCED PASTURE [1]
<input type="checkbox"/> NONE [0]		<input type="checkbox"/> NONE [0]		<input type="checkbox"/> OPEN PASTURE, ROWCROP [0]	

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

Conservation Tillage [1]

Urban or Industrial [0]

Mining / Construction [0]

Comments

Riparian Maximum 10 **8.5**

5] **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply
<input type="checkbox"/> > 1m [8]	<input checked="" type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> TORRENTIAL [-1]
<input type="checkbox"/> 0.7-1m [4]	<input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/> VERY FAST [1]
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]	<input type="checkbox"/> FAST [1]
<input type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> MODERATE [1]
<input checked="" type="checkbox"/> < 0.2m [0]		<input type="checkbox"/> INTERSTITIAL [-1]

Indicate for reach - pools and riffles.

Recreation Potential

Primary Contact

Secondary Contact (circle one and comment on back)

Comments

Pool / Current Maximum 12 **3**

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

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

Comments

Riffle / Run Maximum 8 **4**

6] **GRADIENT** (12.99 ft/mi) ☐ VERY LOW - LOW [2-4] ☒ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (3.82 mi<sup>2</sup>)

%POOL: 40 %GLIDE: ---

%RUN: 30 %RIFFLE: 30

Gradient Maximum 10 **8**



# AJ SAMPLED REACH

Check ALL that apply

## METHOD

- ☐ BOAT  
☐ WADE  
☐ LINE  
☐ OTHER
- ☐ DISTANCE  
☐ 0.5 Km  
☐ 0.2 Km  
☐ 0.15 Km  
☐ 0.12 Km  
☐ OTHER
- ☐ CLARITY  
☐ 1st sample pass-- 2nd  
☐ < 20 cm  
☐ 20-40 cm  
☐ 40-70 cm  
☐ > 70 cm/CTB  
☐ SECCHI DEPTH
- ☐ CANOPY  
☐ 1st  
☐ 2nd  
☐ > 85% - OPEN  
☒ 55%-85%  
☐ 30%-55%  
☐ 10%-30%  
☐ < 10% - CLOSED

## STAGE

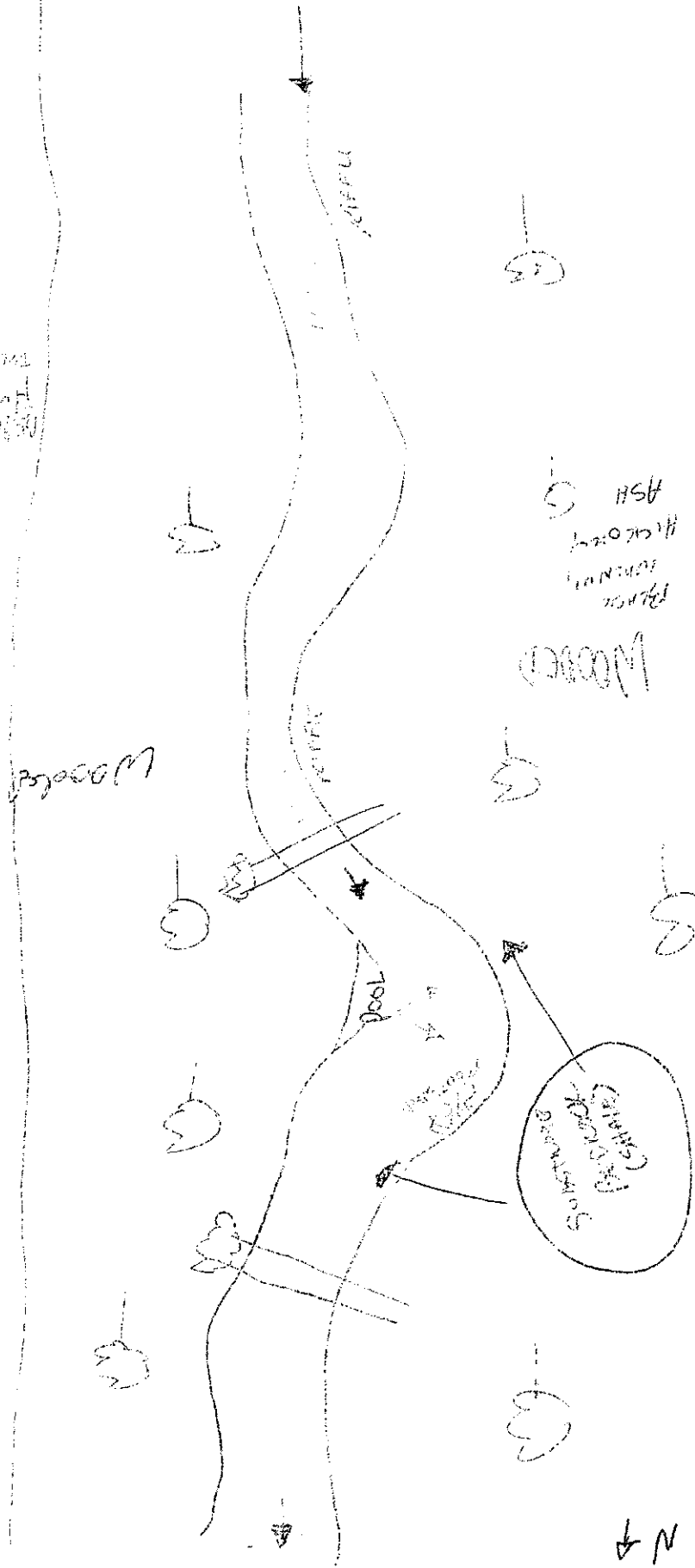
- ☐ HIGH  
☐ UP  
☐ NORMAL  
☐ LOW  
☐ DRY

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

QUEST FIVE PERCENT MINOR

FJ MEASUREMENTS		EJ ISSUES		DJ MAINTENANCE		BJ AESTHETICS		CJ RECREATION	
WWT / CSO / NPDES / INDUSTRY	WASH H <sub>2</sub> O / TILE / H <sub>2</sub> O TABLE	PUBLIC / PRIVATE / BOTH / NA	NUISANCE ALGAE	AREA DEPTH	1st	2nd	CLARITY	1st	2nd
HARDENED / URBAN / DIRT & GRIME	ACID / MINE / QUARRY / FLOW	ACTIVE / HISTORIC / BOTH / NA	INVASIVE MACROPHYTES	ISLANDS / SCOURED	cm	cm	< 20 cm	cm	cm
CONTAMINATED / LANDFILL	NATURAL / WETLAND / STAGNANT	YOUNG-SUCCESSION-OLD	EXCESS TURBIDITY	IMPOUNDED / DESICCATED			20-40 cm		
BMPs-CONSTRUCTION-SEDIMENT	PARK / GOLF / LAWN / HOME	SPRAY / SNAG / REMOVED	DISCOLORATION	FLOOD CONTROL / DRAINAGE			40-70 cm		
LOGGING / IRRIGATION / COOLING	ATMOSPHERE / DATA PAUCITY	MODIFIED / DIPPED OUT / NA	FOAM / SCUM				> 70 cm/CTB		
BANK / EROSION / SURFACE		LEVEED / ONE SIDED	OIL SHEEN				SECCHI DEPTH		
FALSE BANK / MANURE / LAGOON		RELOCATED / CUTOFFS	TRASH / LITTER						
WASH H <sub>2</sub> O / TILE / H <sub>2</sub> O TABLE		MOVING-BEDLOAD-STABLE	NUISANCE ODOR						
ACID / MINE / QUARRY / FLOW		ARMORED / SLUMPS	SLUDGE DEPOSITS						
NATURAL / WETLAND / STAGNANT		ISLANDS / SCOURED	CSOs/SSOs/OUTFALLS						
PARK / GOLF / LAWN / HOME		IMPOUNDED / DESICCATED							
ATMOSPHERE / DATA PAUCITY		FLOOD CONTROL / DRAINAGE							

## Stream Drawing:



YR-2016

QUALITATIVE HABITAT EVALUATION INDEX

QH-MD08311-016

Ohio EPA

# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score:

58

Stream & Location: DE BDB PREFERRED ROUTE & ALTERNATE ROUTE RM: Date: 08/31/11

River Code: STORET #: Scorers Full Name & Affiliation: B OTTO, M. Thomaier, URS Corp  
Lat./Long.: 18 Office verified location

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

Check ONE (Or 2 & average)

BEST TYPES		OTHER TYPES		ORIGIN		QUALITY	
<input type="checkbox"/> BEDR/SLABS [10]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT	<input type="checkbox"/> HEAVY [2]	Substrate 11 Maximum 20
<input type="checkbox"/> BOULDER [10]	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> LILLS [1]	<input type="checkbox"/> WETLANDS [10]	<input type="checkbox"/> MODERATE [1-1]	<input type="checkbox"/> MODERATE [1-1]	
<input type="checkbox"/> COBBLE [8]	<input type="checkbox"/> SILT [2]	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> FREE [1]	<input type="checkbox"/> EXTENSIVE [1-2]	
<input type="checkbox"/> GRAVEL [7]	30 30		<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/> MODERATE [1-1]	<input type="checkbox"/> MODERATE [1-1]	
<input type="checkbox"/> SAND [6]	40 40		<input type="checkbox"/> SHALE [1-1]	<input type="checkbox"/> COAL FINES [1-2]	<input type="checkbox"/> NONE [1]	<input type="checkbox"/> NONE [1]	
<input checked="" type="checkbox"/> BEDROCK [5]							

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [10] (Score natural substrates; ignore sludge from point-sources)

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.

AMOUNT

Check ONE (Or 2 & average)

UNDERCUT BANKS [1]		POOLS > 70cm [2]		OXBOWS BACKWATERS [1]		AMOUNT	
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> AQUATIC MACROPHYTES [1]	<input type="checkbox"/> EXTENSIVE > 75% [11]	<input type="checkbox"/> MODERATE 25-75% [7]	<input type="checkbox"/> SPARSE 5-25% [3]	<input type="checkbox"/> NEARLY ABSENT < 5% [1]	Cover Maximum 20 11
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> LOGS OR WOODY DEBRIS [1]	<input type="checkbox"/> MODERATE [1-1]	<input type="checkbox"/> MODERATE [1-1]	<input type="checkbox"/> MODERATE [1-1]	<input type="checkbox"/> MODERATE [1-1]	
<input type="checkbox"/> ROOTMATS [1]			<input type="checkbox"/> MODERATE [1-1]	<input type="checkbox"/> MODERATE [1-1]	<input type="checkbox"/> MODERATE [1-1]	<input type="checkbox"/> MODERATE [1-1]	

Comments

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

SINUOSITY		DEVELOPMENT		CHANNELIZATION		STABILITY	
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	Channel Maximum 20 14
<input checked="" type="checkbox"/> MODERATE [3]	<input checked="" type="checkbox"/> GOOD [5]	<input checked="" type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	
<input type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	

Comments

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

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY		CONSERVATION TILLAGE [1]	
<input type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FOREST SWAMP [3]	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]	<input type="checkbox"/> MINING / CONSTRUCTION [0]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	Riparian Maximum 10 8
<input checked="" type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL PARK NEW FIELD [1]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	
	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	
	<input type="checkbox"/> NONE [0]	<input type="checkbox"/> OPEN PASTURE ROWCROP [0]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE [2]	

Comments

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH		CHANNEL WIDTH		CURRENT VELOCITY		Recreation Potential	
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply	Primary Contact		Secondary Contact		Pool / Current Maximum 12 2
<input type="checkbox"/> > 1m [6]	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> TORRENTIAL [1]	<input checked="" type="checkbox"/> SLOW [1]	<input type="checkbox"/> INTERSTITIAL [1-1]	<input type="checkbox"/> INTERMITTENT [1-2]	<input type="checkbox"/> EDDIES [1]	
<input type="checkbox"/> 0.7-1m [4]	<input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/> VERY FAST [1]	<input type="checkbox"/> INTERSTITIAL [1-1]	<input type="checkbox"/> INTERMITTENT [1-2]	<input type="checkbox"/> EDDIES [1]	<input type="checkbox"/> EDDIES [1]	
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [0]	<input type="checkbox"/> FAST [1]	<input type="checkbox"/> INTERSTITIAL [1-1]	<input type="checkbox"/> INTERMITTENT [1-2]	<input type="checkbox"/> EDDIES [1]	<input type="checkbox"/> EDDIES [1]	
<input type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> MODERATE [1]	<input type="checkbox"/> INTERSTITIAL [1-1]	<input type="checkbox"/> INTERMITTENT [1-2]	<input type="checkbox"/> EDDIES [1]	<input type="checkbox"/> EDDIES [1]	
<input checked="" type="checkbox"/> < 0.2m [0]			<input type="checkbox"/> INTERSTITIAL [1-1]	<input type="checkbox"/> INTERMITTENT [1-2]	<input type="checkbox"/> EDDIES [1]	<input type="checkbox"/> EDDIES [1]	

Comments

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	
<input type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input checked="" type="checkbox"/> STABLE (e.g. Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]	<input type="checkbox"/> MODERATE [0]	<input type="checkbox"/> MODERATE [0]	<input type="checkbox"/> MODERATE [0]	Riffle / Run Maximum 8 4
<input type="checkbox"/> BEST AREAS 5-10cm [1]	<input checked="" type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g. Large Gravel) [1]	<input checked="" type="checkbox"/> LOW [1]	<input type="checkbox"/> MODERATE [0]	<input type="checkbox"/> MODERATE [0]	<input type="checkbox"/> MODERATE [0]	
<input checked="" type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g. Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]	<input type="checkbox"/> MODERATE [0]	<input type="checkbox"/> MODERATE [0]	<input type="checkbox"/> MODERATE [0]	

Comments

6) GRADIENT		%POOL:		%GLIDE:		Gradient	
ft/mi	<input type="checkbox"/> VERY LOW / LOW [2-4]	40				8	Maximum 10 8
m/mi	<input checked="" type="checkbox"/> MODERATE [6-10]	30					
	<input type="checkbox"/> HIGH / VERY HIGH [10-6]						

Check ALL that apply

**METHOD**

**STAGE**

Small fish in mainwells observed

☐ BOAT

1st sample pass-- 2nd

☐ WADE

☐ HIGH

☐ L LINE

☐ UP

☐ OTHER

☐ NORMAL

**DISTANCE**

☐ LOW

☐ 0.5 Km

☐ DRY

☐ 0.2 Km

☐ CLARITY

☐ 0.15 Km

1st sample pass-- 2nd

☐ 0.12 Km

☐ < 20 cm

☐ OTHER

☐ 20-40 cm

☐ meters

☐ 40-70 cm

☐ CANOPY

☐ > 70 cm/CTB

☐ > 85% - OPEN

☐ 1st

☐ 55%-<85%

☐ 2nd

☐ 30%-<55%

☐ cm

☐ 10%-<30%

☐ cm

☐ <10% - CLOSED

☐ 1st

☐ CJ RECREATION

☐ AREA DEPTH

☐ POOL: >100ft

☐ >3ft

☐ BI/ AESTHETICS

☐ NUISANCE ALGAE

☐ INVASIVE MACROPHYTES

☐ EXCESS TURBIDITY

☐ DISCOLORATION

☐ FOAM / SCUM

☐ OIL SHEEN

☐ TRASH / LITTER

☐ NUISANCE ODOR

☐ SLUDGE DEPOSITS

☐ CSOS/SSOS/OUTFALLS

☐ 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 / DIRTY GRIME

☐ CONTAMINATED / LANDFILL

☐ BMPs-CONSTRUCTION-SEDIMENT

☐ LOGGING / IRRIGATION / COOLING

☐ BANK / EROSION / SURFACE

☐ FALSE BANK / MANURE / LAGOON

☐ WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE

☐ ACID / MINE / QUARRY / FLOW

☐ NATURAL / WETLAND / STAGNANT

☐ PARK / GOLF / LAWN / HOME

☐ ATMOSPHERE / DATA PAUCITY

☐ F/ MEASUREMENT

☐  $\bar{x}$  width - 15'

☐  $\bar{x}$  depth 3-4"

☐ max. depth - 5"

☐  $\bar{x}$  bankfull width

☐ bankfull  $\bar{x}$  depth

☐ W/D ratio

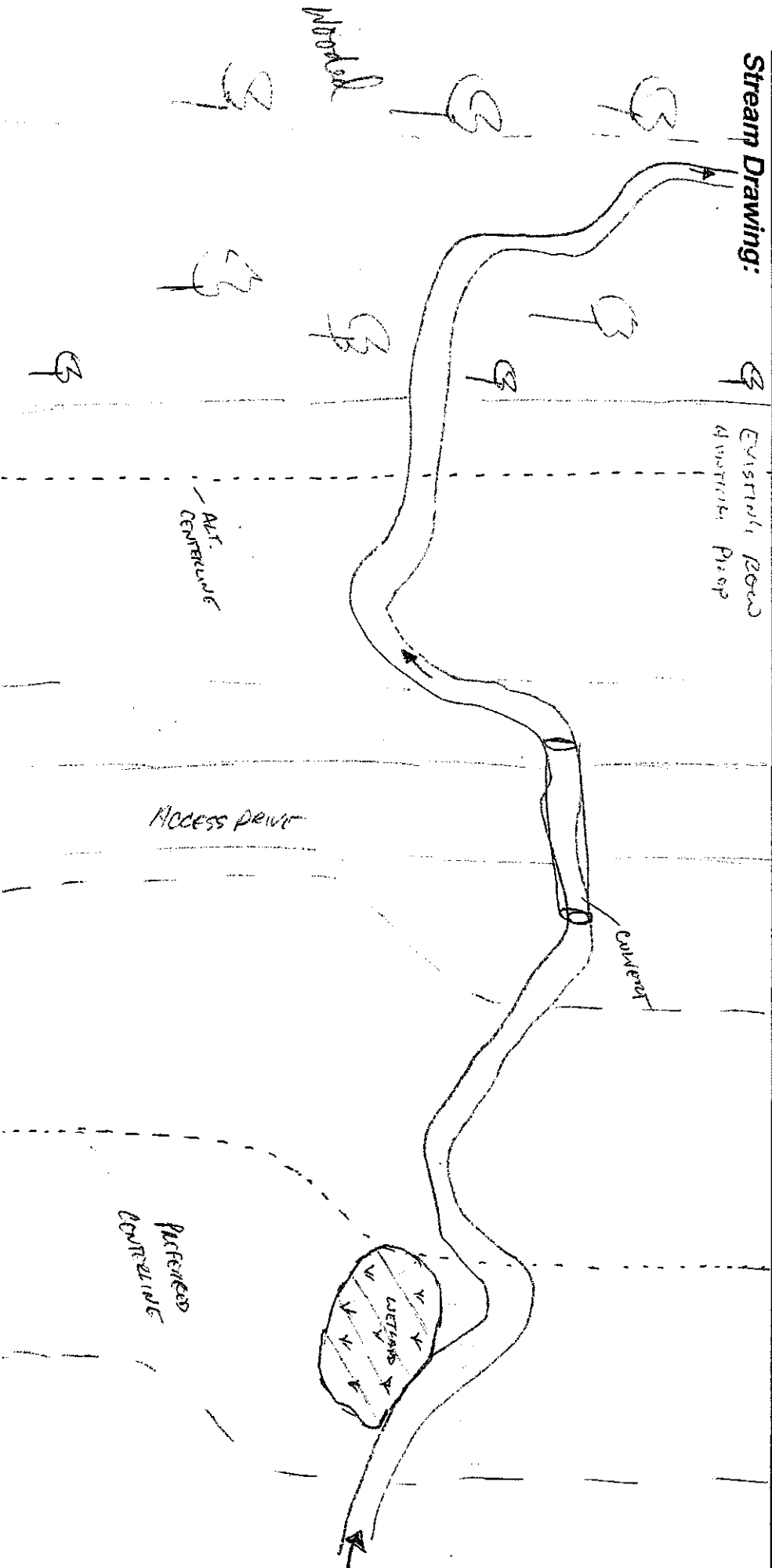
☐ bankfull max. depth

☐ floodprone  $\bar{x}^2$  width

☐ entrench. ratio

☐ Legacy Tree:

**Stream Drawing:**



Pr-501c

Quarry Creek

4H - 540083011-1

**OhioEPA****Qualitative Habitat Evaluation Index  
and Use Assessment Field Sheet****QHEI Score:** 56.5**Stream & Location:** gh-bao 08/30/11-1, BDB preferred route **RM:**      **Date:** 8/30/11**Scorers Full Name & Affiliation:** M. Thomayer, URS Corp.  
**River Code:**      **STORET #:**      **Lat./ Long.:**      **18** **Office verified location** ☐**1) SUBSTRATE** Check ONLY Two substrate TYPE BOXES;  
estimate % or note every type present

Check ONE (Or 2 &amp; average)

BEST TYPES		OTHER TYPES		ORIGIN		QUALITY	
<input type="checkbox"/> BLDR/SLABS [10]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE	<input checked="" type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT	<input type="checkbox"/> HEAVY [-2]	<b>Substrate</b> <div style="border: 1px solid black; width: 40px; height: 40px; text-align: center; line-height: 40px;">14</div> Maximum 20
<input type="checkbox"/> BOULDER [9]	<u>40</u> <u>40</u>	<input type="checkbox"/> DETRITUS [3]	<u>10</u> <u>10</u>	<input type="checkbox"/> TILLS [1]	<input type="checkbox"/> WETLANDS [0]	<input checked="" type="checkbox"/> MODERATE [-1]	
<input checked="" type="checkbox"/> COBBLE [8]	<u>25</u> <u>25</u>	<input type="checkbox"/> MUCK [2]	<u>5</u> <u>5</u>	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> NORMAL [0]	
<input type="checkbox"/> GRAVEL [7]	<u>70</u> <u>70</u>	<input type="checkbox"/> SILT [2]	<u>70</u> <u>70</u>	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> FREE [1]	
<input type="checkbox"/> SAND [6]		<input type="checkbox"/> ARTIFICIAL [0]		<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/> SHALE [-1]	<input checked="" type="checkbox"/> MODERATE [-1]	
<input type="checkbox"/> BEDROCK [5]				<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/> NONE [1]	<input type="checkbox"/> NONE [1]	

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

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

**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.)**AMOUNT**

Check ONE (Or 2 &amp; average)

<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70cm [2]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]	<input type="checkbox"/> EXTENSIVE >75% [11]
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> AQUATIC MACROPHYTES [1]	<input checked="" type="checkbox"/> MODERATE 25-75% [7]
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> LOGS OR WOODY DEBRIS [1]	<input checked="" type="checkbox"/> SPARSE 5-<25% [3]
<input type="checkbox"/> ROOTMATS [1]			<input type="checkbox"/> NEARLY ABSENT <5% [1]

**Comments****Cover**  
Maximum 20**3) CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input checked="" type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input checked="" type="checkbox"/> NONE [6]	<input checked="" type="checkbox"/> HIGH [3]
<input checked="" type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]
<input type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	

**Comments****Channel**  
Maximum 20**4) BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION	RIPIARIAN WIDTH	FLOOD PLAIN QUALITY	CONSERVATION TILLAGE
<input checked="" type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FOREST, SWAMP [3]	<input type="checkbox"/> CONSERVATION TILLAGE [1]
<input type="checkbox"/> MODERATE [2]	<input checked="" type="checkbox"/> MODERATE 10-50m [3]	<input checked="" type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> MINING / CONSTRUCTION [0]
	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]	
	<input type="checkbox"/> NONE [0]	<input type="checkbox"/> OPEN PASTURE, ROWCROP [0]	

**Comments**Indicate predominant land use(s)  
past 100m riparian. **Riparian**  
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 &amp; 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)

**Pool / Current**  
Maximum 12**Comments**

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 &amp; 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]  
☒ BEST AREAS 5-10cm [1] ☒ MAXIMUM < 50cm [1] ☐ MOD. STABLE (e.g., Large Gravel) [1]  
☐ BEST AREAS < 5cm [metric=0] ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

**Comments**

- ☐ NONE [2]  
☒ LOW [1]  
☐ MODERATE [0]  
☐ EXTENSIVE [-1]

**Riffle / Run**  
Maximum 8**6) GRADIENT** (4.88 ft/mi)**DRAINAGE AREA**(2.31 mi<sup>2</sup>)

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

%POOL:

%GLIDE:

**Gradient**

%RUN:

%RIFFLE:

**Maximum**10<sup>ft</sup> / 2.05m = 4.88

# **AJ SAMPLED REACH**

Check ALL that apply

## **METHOD**

- ☐ BOAT  
☐ WADE  
☐ LINE  
☒ OTHER  
**DISTANCE**  
☐ 0.5 Km  
☐ 0.2 Km  
☐ 0.15 Km  
☐ 0.12 Km  
☐ OTHER  
**CLARITY**  
 1st sample pass-- 2nd  
☐ <20 cm  
☐ 20-40 cm  
☐ 40-70 cm  
☐ >70 cm/CTB  
☐ SECCHI DEPTH  
 1st 2nd  
☐ >85% OPEN  
☐ 55%-85%  
☒ 30%-55%  
☐ 10%-30%  
☐ <10% CLOSED

## **STAGE**

- ☐ HIGH  
☐ UP  
☒ NORMAL  
☐ LOW  
☐ DRY

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

## **BJ AESTHETICS**

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

## **DJ 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

## **EJ 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<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
 ACID / MINE / QUARRY / FLOW  
 NATURAL / WETLAND / STAGNANT  
 PARK / GOLF / LAWN / HOME  
 ATMOSPHERE / DATA PAUCITY

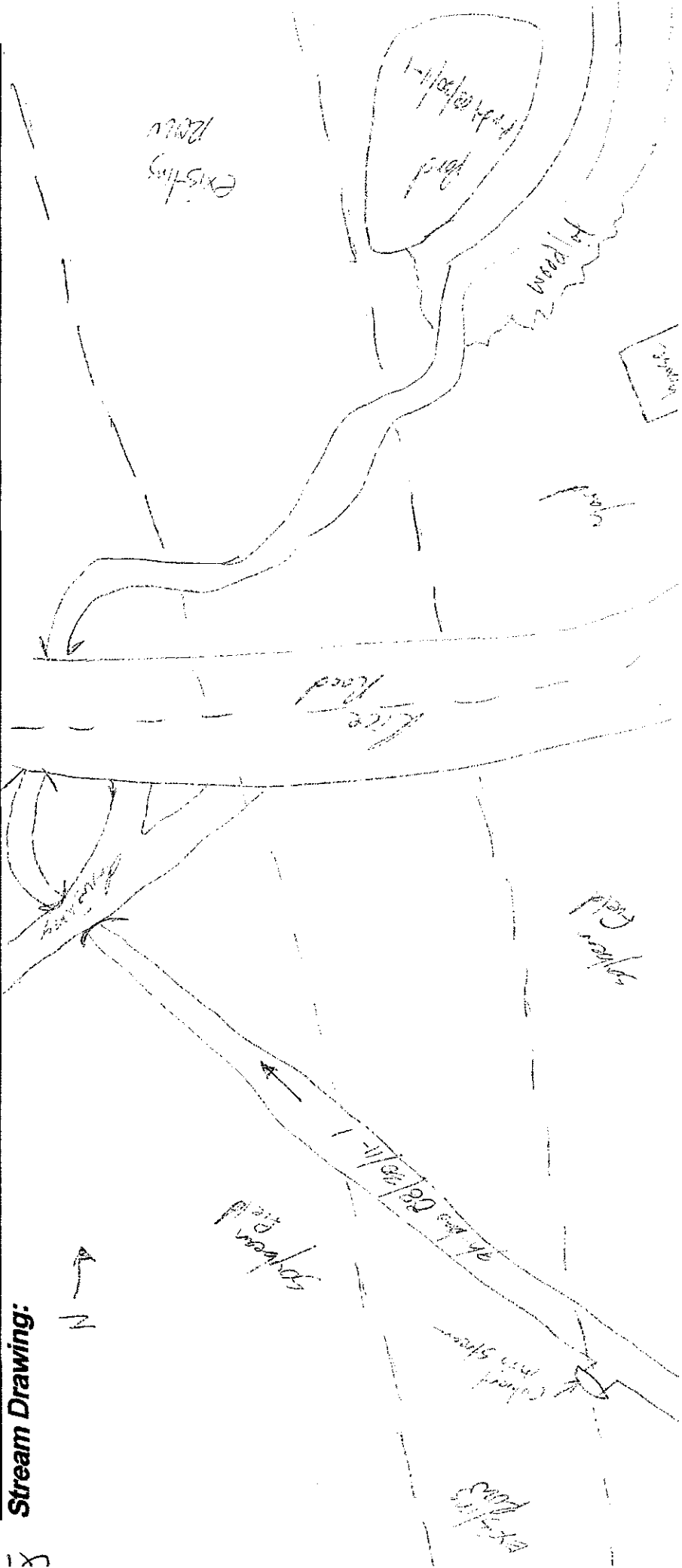
## **FJ MEASUREMENTS**

- ☐ width  
☐ depth  
 max. depth  
☐ bankfull width  
☐ bankfull x depth  
 W/D ratio  
 bankfull max. depth  
 floodprone x<sup>2</sup> width  
 entrench. ratio  
 Legacy Tree:

## **CJ RECREATION**

AREA DEPTH  
 POOL: ☐ >100ft ☐ >3ft

## **Stream Drawing:**



**APPENDIX D**  
**OHIO EPA HHEI STREAM FORMS**



## Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3):

11

SITE NAME/LOCATION FE BDB- NC - ALT. ROUTESITE NUMBER 3A

RIVER BASIN \_\_\_\_\_

DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_

LENGTH OF STREAM REACH (ft) \_\_\_\_\_ LAT. \_\_\_\_\_ LONG. \_\_\_\_\_ RIVER CODE \_\_\_\_\_ RIVER MILE \_\_\_\_\_

DATE 08/11 SCORER BAD COMMENTS INT.

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL ☐ NONE / NATURAL CHANNEL ☒ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERYMODIFICATIONS: W/IN ROW & APPEARS TO HAVE BEEN CHANNELIZED

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input type="checkbox"/> SILT [3 pt]	<u>20</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>30</u>
<input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> FINE DETRITUS [3 pts]	_____
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]	<u>50</u>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	_____	<input type="checkbox"/> MUCK [0 pts]	_____
<input type="checkbox"/> SAND (<2 mm) [8 pts]	_____	<input type="checkbox"/> ARTIFICIAL [3 pts]	_____

Total of Percentages of  
Bltr Slabs, Boulder, Cobble, Bedrock0

(A)

3

(B)

3

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
PointsSubstrate  
Max = 406

A + B

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

Pool Depth  
Max = 300

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]	

Bankfull  
Width  
Max=305

COMMENTS \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters)

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

## RIPARIAN WIDTH

L	R	(Per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

## FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS \_\_\_\_\_

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input type="checkbox"/> Stream Flowing	<input checked="" type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS \_\_\_\_\_

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input checked="" type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

## STREAM GRADIENT ESTIMATE

☐ Flat (0.5 ft/100 ft) ☒ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

**ADDITIONAL STREAM INFORMATION (This information must also be completed):**QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

☐ EWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order \_\_\_\_\_

County: Lorain County Township / City: \_\_\_\_\_**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: unk Quantity: \_\_\_\_\_

Photograph Information: \_\_\_\_\_

Elevated Turbidity? (Y/N): \_\_\_\_\_ Canopy (% open): \_\_\_\_\_

Were samples collected for water chemistry? (Y/N): \_\_\_\_\_ (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH (S.U.) \_\_\_\_\_ Conductivity (µmhos/cm) \_\_\_\_\_

Is the sampling reach representative of the stream (Y/N) \_\_\_\_\_ If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

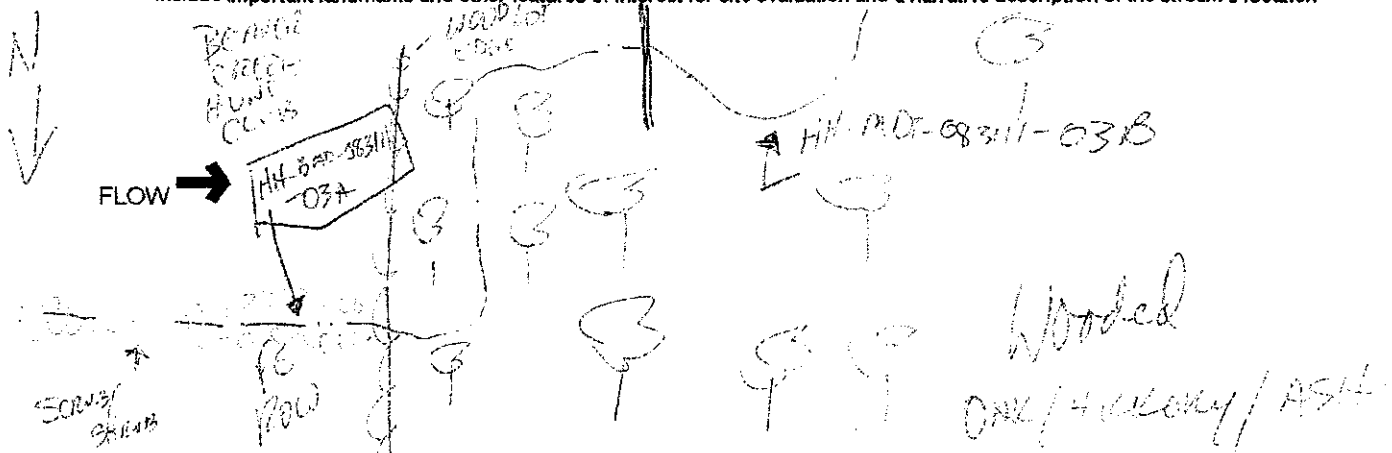
Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Comments Regarding Biology: \_\_\_\_\_

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Alt-5016

HH-MDT-083111-038



## Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

51

SITE NAME/LOCATION KE MDN - NC - AUT ROUTESITE NUMBER 3B

RIVER BASIN \_\_\_\_\_

DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_

LENGTH OF STREAM REACH (ft) \_\_\_\_\_

LAT. \_\_\_\_\_

LONG. \_\_\_\_\_

RIVER CODE \_\_\_\_\_

RIVER MILE \_\_\_\_\_

DATE 083111SCORER B40COMMENTS INTERMITTENT

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL



NONE / NATURAL CHANNEL



RECOVERED



RECOVERING



RECENT OR NO RECOVERY

MODIFICATIONS:

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]		<input type="checkbox"/> SILT [3 pts]	
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<u>2</u>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>5</u>
<input checked="" type="checkbox"/> BEDROCK [16 pts] <u>SHALE</u>	<u>40</u>	<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>10</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pts]	<u>15</u>
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>28</u>	<input type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> SAND (<2 mm) [6 pts]		<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock 52

(A)

25

(B)

6

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
PointsSubstrate  
Max = 4031

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input checked="" type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

7cmPool Depth  
Max = 3015

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]	

COMMENTS \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters)

3'Bankfull  
Width  
Max=305This information must also be completed

## RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream☆

## RIPARIAN WIDTH

L	R	(Per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS \_\_\_\_\_

## FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input type="checkbox"/> Stream Flowing	<input checked="" type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS \_\_\_\_\_

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input checked="" type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

## STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 ft/100 ft)	<input type="checkbox"/> Flat to Moderate	<input checked="" type="checkbox"/> Moderate (2 ft/100 ft)	<input type="checkbox"/> Moderate to Severe	<input type="checkbox"/> Severe (10 ft/100 ft)
---	---	--	---	--

**ADDITIONAL STREAM INFORMATION (This information must also be completed):**

**QHEI PERFORMED?** - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)

## DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_  
☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_  
☐ EWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order \_\_\_\_\_  
County: Lorain County Township / City: \_\_\_\_\_

### MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: Verd Quantity: \_\_\_\_\_

Photograph Information: \_\_\_\_\_

Elevated Turbidity? (Y/N): \_\_\_\_\_ Canopy (% open): \_\_\_\_\_

Were samples collected for water chemistry? (Y/N): \_\_\_\_\_ (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH (S.U.) \_\_\_\_\_ Conductivity (µmhos/cm) \_\_\_\_\_

Is the sampling reach representative of the stream (Y/N) \_\_\_\_\_ If not, please explain: \_\_\_\_\_

\_\_\_\_\_

Additional comments/description of pollution impacts: \_\_\_\_\_

## BIOTIC EVALUATION

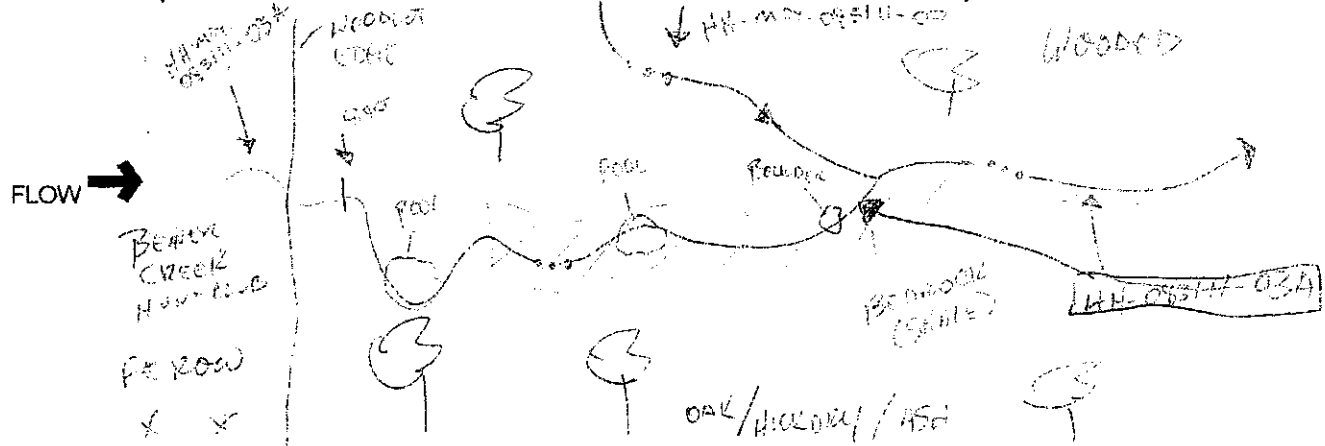
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Comments Regarding Biology: \_\_\_\_\_

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

**Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location**



A11-502

#4-MBT-08311-02



## Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3):

19

SITE NAME/LOCATION BD13 - NC - ALTERNATE 1007

SITE NUMBER

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>)

LENGTH OF STREAM REACH (ft)

LAT.

LONG.

RIVER CODE

RIVER MILE

DATE 083011SCORER Bao

COMMENTS

EDH

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL

☐ NONE / NATURAL CHANNEL☒ RECOVERED☐ RECOVERING☐ RECENT OR NO RECOVERY

MODIFICATIONS:

from DRAINAGE IN FIELD

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE

☐

BLDR SLABS [16 pts]

☐

BOULDER (&gt;256 mm) [16 pts]

☐

BEDROCK [16 pts]

☐

COBBLE (65-256 mm) [12 pts]

☒

GRAVEL (2-64 mm) [8 pts]

☐

SAND (&lt;2 mm) [6 pts]

PERCENT

15103025

TYPE

☐

SILT [3 pts]

☐

LEAF PACKWOODY DEBRIS [3 pts]

☐

FINE DETRITUS [3 pts]

☒

CLAY or HARDPAN [0 pts]

☐

MUCK [0 pts]

☐

ARTIFICIAL [3 pts]

PERCENT

540Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock25

(A)

9

(B)

5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
PointsSubstrate  
Max = 4014

A + B

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

☐

&gt; 30 centimeters [20 pts]

☐

&gt; 22.5 - 30 cm [30 pts]

☐

&gt; 10 - 22.5 cm [25 pts]

☐

&gt; 5 cm - 10 cm [15 pts]

☐

&lt; 5 cm [5 pts]

☒

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

0Pool Depth  
Max = 300

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

☐

&gt; 4.0 meters (&gt; 13') [30 pts]

☐

&gt; 3.0 m - 4.0 m (&gt; 9' 7" - 13') [25 pts]

☐

&gt; 1.5 m - 3.0 m (&gt; 4' 8" - 9' 7") [20 pts]

☐

&gt; 1.0 m - 1.5 m (&gt; 3' 3" - 4' 8") [15 pts]

☒

≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters)

ft.

2'Bankfull  
Width  
Max=305

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L

R

(Per Bank)

☒☒

Wide &gt;10m

☐☐

Moderate 5-10m

☐☐

Narrow &lt;5m

☐☐

None

☐☐

None

COMMENTS

L

R

(Most Predominant per Bank)

☒☒

Mature Forest, Wetland

☐☐

Immature Forest, Shrub or Old

☐☐

Field

☐☐

Residential, Park, New Field

☐☐

Fenced Pasture

L

R

Conservation Tillage

☐☐

Urban or Industrial

☐☐

Open Pasture, Row

☐☐

Crop

☐☐

Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

☐

Stream Flowing

☐

Subsurface flow with isolated pools (Interstitial)

☐

Moist Channel, isolated pools, no flow (Intermittent)

☒

Dry channel, no water (Ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

☐

None

☐

0.5

☐

1.0

☐

1.5

☒

2.0

☐

2.5

☐

3.0

☐

&gt;3

STREAM GRADIENT ESTIMATE

☐

Flat (0.5 ft/100 ft)

☐

Flat to Moderate

☒

Moderate (2 ft/100 ft)

☐

Moderate to Severe

☐

Severe (10 ft/100 ft)

**ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):**QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

☐ EWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order \_\_\_\_\_

County: Lorain County Township / City: \_\_\_\_\_**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: UNK Quantity: \_\_\_\_\_

Photograph Information: \_\_\_\_\_

Elevated Turbidity? (Y/N): \_\_\_\_\_ Canopy (% open): \_\_\_\_\_

Were samples collected for water chemistry? (Y/N): \_\_\_\_\_ (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH (S.U.) \_\_\_\_\_ Conductivity (µmhos/cm) \_\_\_\_\_

Is the sampling reach representative of the stream (Y/N) \_\_\_\_\_ If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**Performed? (Y/N): Y (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

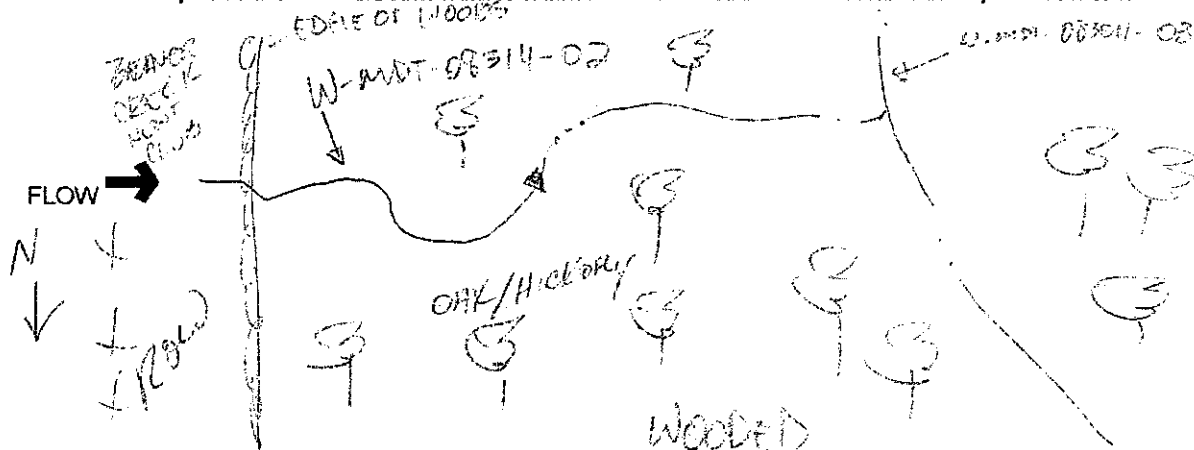
Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Comments Regarding Biology: \_\_\_\_\_

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





## Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3):

13

SITE NAME/LOCATION FE BDR - NC - ALT. RouteSITE NUMBER 1

RIVER BASIN \_\_\_\_\_

DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_

LENGTH OF STREAM REACH (ft) \_\_\_\_\_

LAT. \_\_\_\_\_

LONG. \_\_\_\_\_

RIVER CODE \_\_\_\_\_

RIVER MILE \_\_\_\_\_

DATE 08-31-11SCORER BDO

COMMENTS \_\_\_\_\_

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

## STREAM CHANNEL

☐ NONE / NATURAL CHANNEL ☒ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

## MODIFICATIONS:

ORIGINATES FROM DRAINAGE TILE, FORMER DRAINAGE TILE OBSERVED E/W IN CHANNEL

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]		<input checked="" type="checkbox"/> SILT [3 pt]	30
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]		<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	
<input type="checkbox"/> BEDROCK [16 pts]	20	<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	10	<input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]	30
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	10	<input type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> SAND (<2 mm) [6 pts]		<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock 30

(A)

3

(B)

5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
PointsSubstrate  
Max = 40

A + B

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

Pool Depth  
Max = 30

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]	

COMMENTS \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters)

Bankfull  
Width  
Max=30

This information must also be completed

## RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream☆

## RIPARIAN WIDTH

L	R	(Per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS \_\_\_\_\_

## FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

## FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS \_\_\_\_\_

## SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input checked="" type="checkbox"/> >3

## STREAM GRADIENT ESTIMATE

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☒ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

**ADDITIONAL STREAM INFORMATION (This information must also be completed):**

QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)

**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_  
☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_  
☐ EWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order \_\_\_\_\_  
 County: Lorain County Township / City: \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): \_\_\_\_\_ Date of last precipitation: UNK Quantity: \_\_\_\_\_

Photograph Information: \_\_\_\_\_

Elevated Turbidity? (Y/N): \_\_\_\_\_ Canopy (% open): \_\_\_\_\_

Were samples collected for water chemistry? (Y/N): \_\_\_\_\_ (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH (S.U.) \_\_\_\_\_ Conductivity (µmhos/cm) \_\_\_\_\_

Is the sampling reach representative of the stream (Y/N): \_\_\_\_\_ If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: \_\_\_\_\_

**Biotic Evaluation**

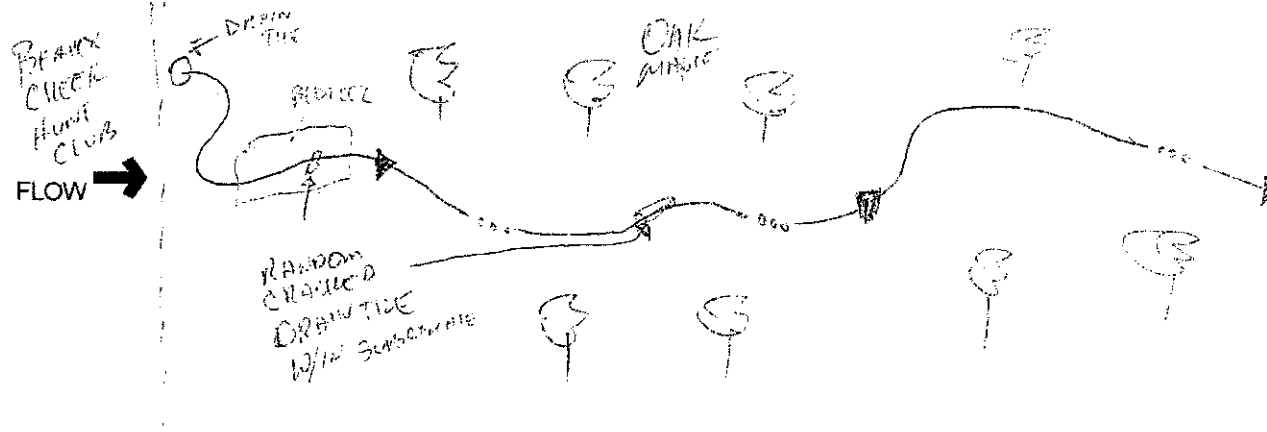
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
 Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Comments Regarding Biology: \_\_\_\_\_

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





## Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

12

SITE NAME/LOCATION FE BDB - NC - ALTERNATE ROUTESITE NUMBER 1RIVER BASIN DRAINAGE AREA (mi<sup>2</sup>) LENGTH OF STREAM REACH (ft) LAT. LONG. RIVER CODE RIVER MILE DATE 091511SCORER B40, MDTCOMMENTS EPHEMERAL - NO FLOW

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL



NONE / NATURAL CHANNEL



RECOVERED



RECOVERING



RECENT OR NO RECOVERY

MODIFICATIONS: 

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDG SLABS [16 pts]	<u></u>	<input type="checkbox"/> SILT [3 pts]	<u></u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<u></u>	<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>30</u>
<input type="checkbox"/> BEDROCK [16 pts]	<u>10</u>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<u></u>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u></u>	<input checked="" type="checkbox"/> CLAY or HARDPAN [0 pts]	<u>50</u>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>10</u>	<input type="checkbox"/> MUCK [0 pts]	<u></u>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<u></u>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<u></u>

Total of Percentages of  
Blgr Slabs, Boulder, Cobble, Bedrock 10

(A)

3

(B)

4

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
PointsSubstrate  
Max = 40

7

A + B

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS 

MAXIMUM POOL DEPTH (centimeters):

Pool Depth  
Max = 30

0

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]	

COMMENTS 

AVERAGE BANKFULL WIDTH (meters)

Bankfull  
Width  
Max=30

1.5'

5

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field	<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m	<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field	<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	None	<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS 

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS 

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input checked="" type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

☐ Flat (0.5 ft/100 ft)☐ Flat to Moderate☒ Moderate (2 ft/100 ft)☐ Moderate to Severe☐ Severe (10 ft/100 ft)

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

☐ EWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order \_\_\_\_\_

County: Lorain Township / City: \_\_\_\_\_**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: UNKNOWN Quantity: \_\_\_\_\_

Photograph Information: \_\_\_\_\_

Elevated Turbidity? (Y/N): N Canopy (% open): 15

Were samples collected for water chemistry? (Y/N): \_\_\_\_\_ (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH (S.U.) \_\_\_\_\_ Conductivity (µmhos/cm) \_\_\_\_\_

Is the sampling reach representative of the stream (Y/N) \_\_\_\_\_ If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

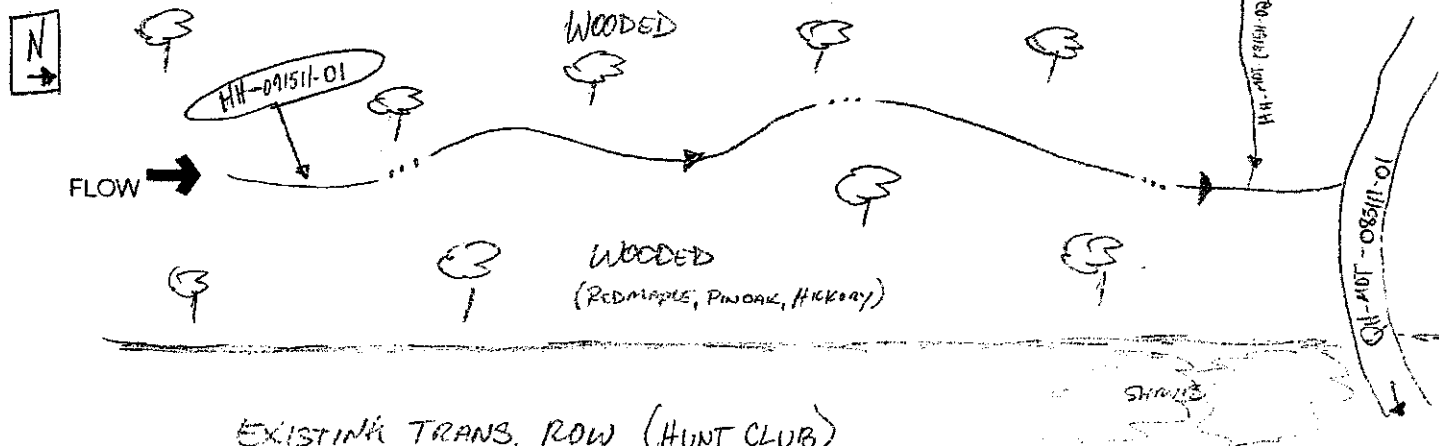
Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Comments Regarding Biology: \_\_\_\_\_

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location







## Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3):

11

SITE NAME/LOCATION FE BDB-NC-ALTERNATE ROUTESITE NUMBER 2

RIVER BASIN \_\_\_\_\_

DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_

LENGTH OF STREAM REACH (ft) \_\_\_\_\_

LAT. \_\_\_\_\_

LONG. \_\_\_\_\_

RIVER CODE \_\_\_\_\_

RIVER MILE \_\_\_\_\_

DATE 09/5/11SCORER BACCOMMENTS EPHEMERAL - NO FLOW

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL

☒ NONE/NATURAL CHANNEL☐ RECOVERED☐ RECOVERING☐ RECENT OR NO RECOVERY

MODIFICATIONS:

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE

☐☐☐☐☐☐☐

BLDR SLABS [16 pts]

BOULDER (&gt;256 mm) [16 pts]

BEDROCK [16 pt]

COBBLE (65-256 mm) [12 pts]

GRAVEL (2-64 mm) [9 pts]

SAND (&lt;2 mm) [6 pts]

PERCENT

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

10

\_\_\_\_\_

TYPE

☐☒☐☒☐☐

SILT [3 pt]

LEAF PACK/WOODY DEBRIS [3 pts]

FINE DETRITUS [3 pts]

CLAY or HARDPAN [0 pt]

MUCK [0 pts]

ARTIFICIAL [3 pts]

PERCENT

\_\_\_\_\_

40

\_\_\_\_\_

50

\_\_\_\_\_

\_\_\_\_\_

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock

(A)

3

(B)

3

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
PointsSubstrate  
Max = 406

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

☐

&gt; 30 centimeters [20 pts]

☐

&gt; 22.5 - 30 cm [30 pts]

☐

&gt; 10 - 22.5 cm [25 pts]

☐

&gt; 5 cm - 10 cm [15 pts]

☐

&lt; 5 cm [5 pts]

☒

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

1Pool Depth  
Max = 300

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

☐

&gt; 4.0 meters (&gt; 13') [30 pts]

☐

&gt; 3.0 m - 4.0 m (&gt; 9' 7" - 13') [25 pts]

☐

&gt; 1.5 m - 3.0 m (&gt; 4' 8" - 9' 7") [20 pts]

☐

&gt; 1.0 m - 1.5 m (&gt; 3' 3" - 4' 8") [15 pts]

☒

≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters)

1'Bankfull  
Width  
Max=305This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH

L R

(Per Bank)

☒ ☒

Wide &gt;10m

☐ ☐

Moderate 5-10m

☐ ☐

Narrow &lt;5m

☐ ☐

None

☐ ☐

None

COMMENTS \_\_\_\_\_

FLOODPLAIN QUALITY

L R

(Most Predominant per Bank)

☒ ☒

Mature Forest, Wetland

☐ ☐

Immature Forest, Shrub or Old

☐ ☐

Field

☐ ☐

Residential, Park, New Field

☐ ☐

Fenced Pasture

L R

Conservation Tillage

☐ ☐

Urban or Industrial

☐ ☐

Open Pasture, Row

☐ ☐

Crop

☐ ☐

Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):☐

Stream Flowing

☐

Subsurface flow with isolated pools (Interstitial)

☐

Moist Channel, isolated pools, no flow (Intermittent)

☒

Dry channel, no water (Ephemeral)

COMMENTS \_\_\_\_\_

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):☐

None

☒

0.5

☐

1.0

☐

1.5

☐

2.0

☐

2.5

☐

3.0

☐

&gt;3

STREAM GRADIENT ESTIMATE

☐

Flat (0.5 ft/100 ft)

☐

Flat to Moderate

☒

Moderate (2 ft/100 ft)

☐

Moderate to Severe

☐

Severe (10 ft/100 ft)

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

☐ EWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order \_\_\_\_\_

County: \_\_\_\_\_ Township / City: \_\_\_\_\_

**MISCELLANEOUS**Base Flow Conditions? (Y/N): N Date of last precipitation: UNK Quantity: \_\_\_\_\_

Photograph Information: \_\_\_\_\_

Elevated Turbidity? (Y/N): \_\_\_\_\_ Canopy (% open): 15

Were samples collected for water chemistry? (Y/N): \_\_\_\_\_ (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH (S.U.) \_\_\_\_\_ Conductivity (µmhos/cm) \_\_\_\_\_

Is the sampling reach representative of the stream (Y/N) \_\_\_\_\_ If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

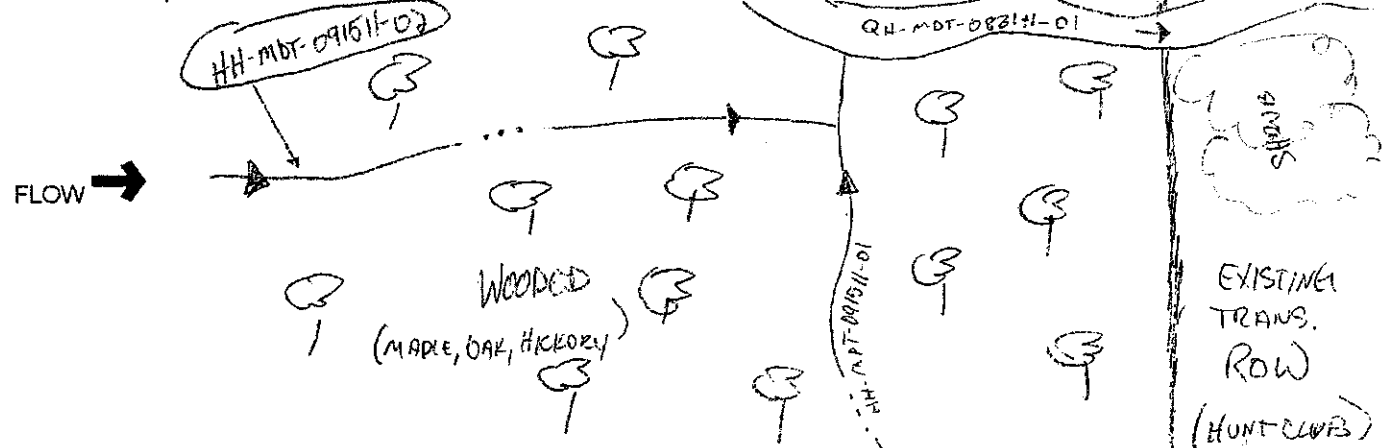
Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Comments Regarding Biology: \_\_\_\_\_

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



**APPENDIX E**  
**DELINEATED FEATURES PHOTOGRAPHS**

**E1 – WETLANDS**



## PHOTOGRAPHIC RECORD Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Brownhelm Junction (Alternate Route)

**Project No.**

14950065

**Photo No. 1**

**Date:**

May 18, 2011

**Description:**

Wetland Pr-w01

PEM



**Photo No. 2**

**Date:**

May 18, 2011

**Description:**

Wetland Pr-w02

PEM





## PHOTOGRAPHIC RECORD Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Brownhelm Junction (Alternate Route)

**Project No.**

14950065

**Photo No. 3**

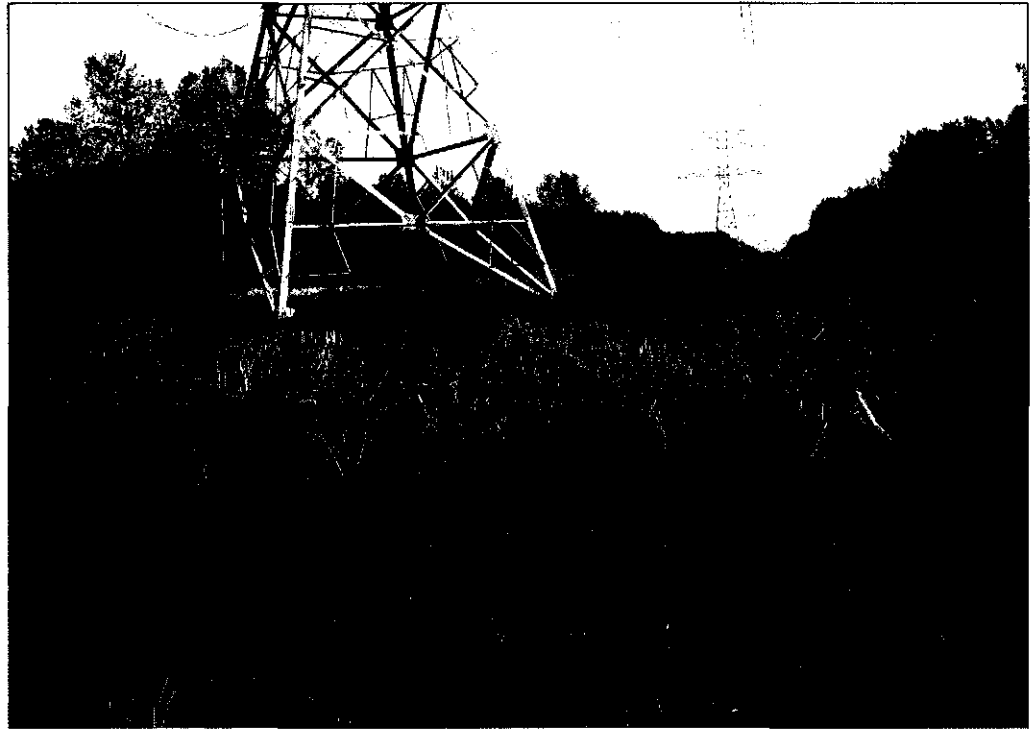
**Date:**

May 18, 2011

**Description:**

Wetland Pr-w03

PEM



**Photo No. 4**

**Date:**

August 31, 2011

**Description:**

Wetland Alt-w01

PEM





## PHOTOGRAPHIC RECORD Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Brownhelm Junction (Alternate Route)

**Project No.**

14950065

**Photo No. 5**

**Date:**

September 15, 2011

**Description:**

Wetland Alt-w02

PEM



**Photo No. 6**

**Date:**

September 15, 2011

**Description:**

Wetland Alt-w03

PEM/PSS





## PHOTOGRAPHIC RECORD Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Brownhelm Junction (Alternate Route)

**Project No.**

14950065

**Photo No. 7****Date:**

September 27, 2011

**Description:**

Wetland Alt-w04b

PEM/PSS

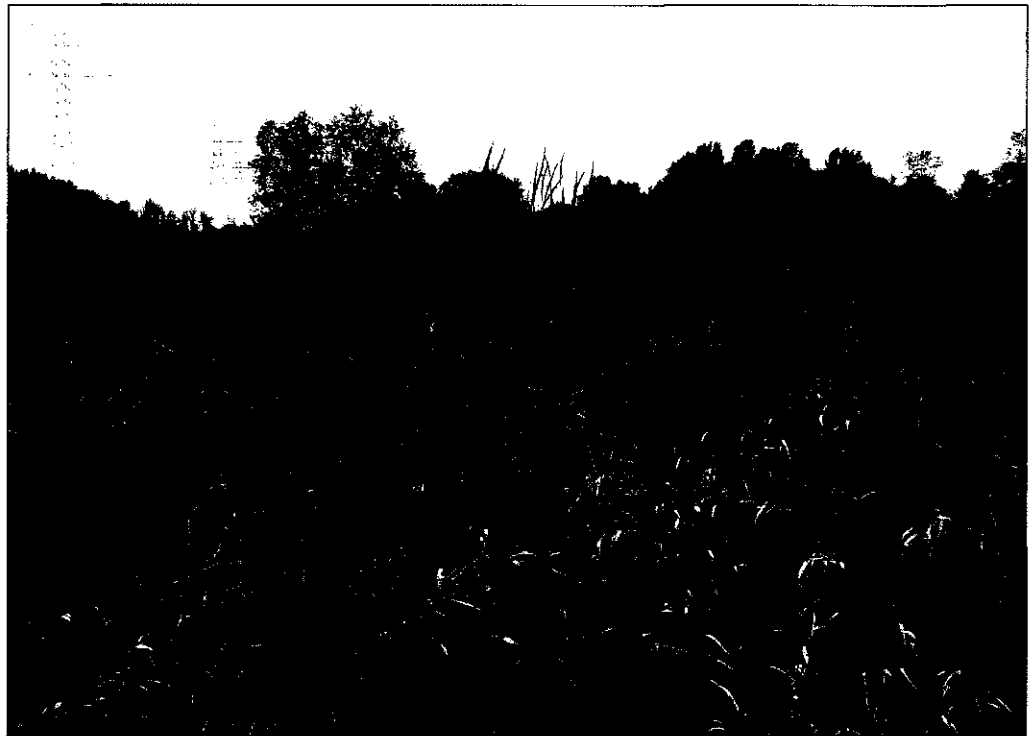
**Photo No. 8****Date:**

September 28, 2011

**Description:**

Wetland Alt-w04a

PEM/PSS





**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Brownhelm Junction (Alternate Route)

**Project No.**

14950065

**Photo No. 9****Date:**

September 28, 2011

**Description:**

Wetland Alt-w05b

PFO/PEM

**Photo No. 10****Date:**

September 27, 2011

**Description:**

Wetland Alt-w05a

PFO/PSS





## PHOTOGRAPHIC RECORD Wetlands

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Brownhelm Junction (Alternate Route)

**Project No.**

14950065

**Photo No. 11****Date:**

April 10, 2012

**Description:**

Wetland Pr-Alt06

PEM

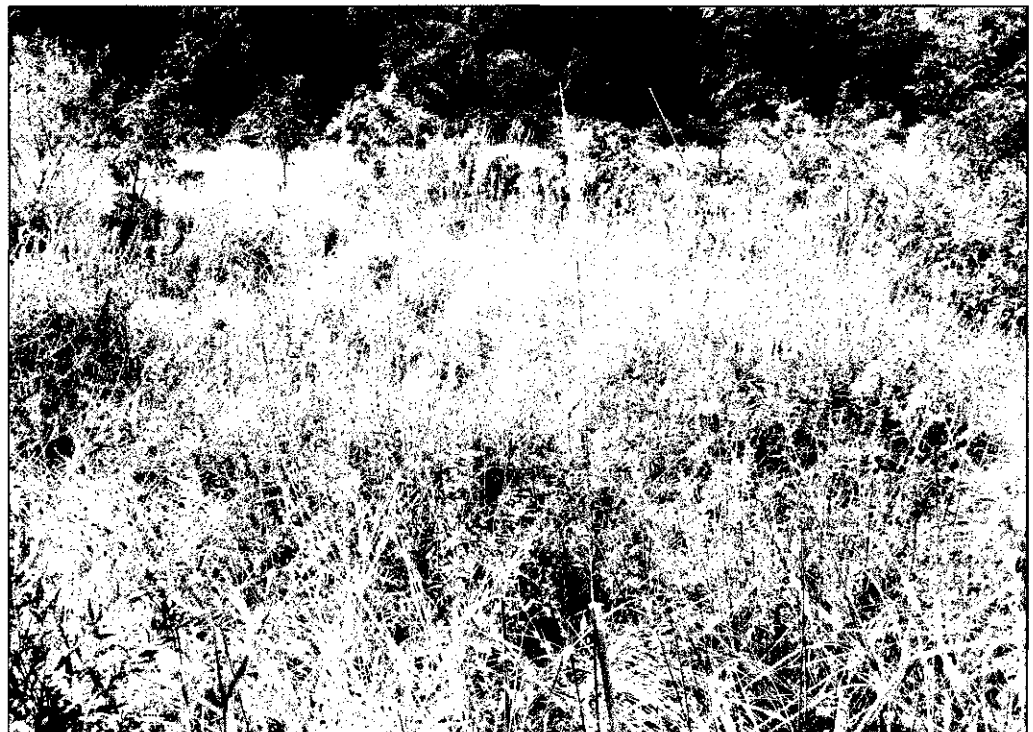
**Photo No. 12****Date:**

August 30, 2011

**Description:**

Wetland Pr-w28

PEM/PSS



**E2 – QHEI STREAMS**



## PHOTOGRAPHIC RECORD QHEI Streams

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Brownhelm Junction (Alternate Route)

**Project No.**

14950065

**Photo No. 1**

**Date:**

August 31, 2011

**Description:**

Pr-s01a

Quarry Creek

Facing Upstream



**Photo No. 2**

**Date:**

August 31, 2011

**Description:**

Pr-s01b

Quarry Creek

Facing Downstream





## PHOTOGRAPHIC RECORD QHEI Streams

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Brownhelm Junction (Alternate Route)

**Project No.**

14950065

**Photo No. 3**

**Date:**

August 30, 2011

**Description:**

Pr-s01c

Quarry Creek

Facing Upstream



**E3 – HHEI STREAMS**



## PHOTOGRAPHIC RECORD HHEI Streams

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Brownhelm Junction (Alternate Route)

**Project No.**

14950065

**Photo No. 1**

**Date:**

August 31, 2011

**Description:**

Alt-s01a

Intermittent Stream

Facing Downstream

(stream channel is  
obscured by vegetation)



**Photo No. 2**

**Date:**

August 31, 2011

**Description:**

Alt-s01b

Intermittent Stream

Facing Downstream





## PHOTOGRAPHIC RECORD HHEI Streams

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Brownhelm Junction (Alternate Route)

**Project No.**

14950065

**Photo No. 3**

**Date:**

August 31, 2011

**Description:**

Alt-s02

Ephemeral Stream

Facing Downstream



**Photo No. 4**

**Date:**

August 31, 2011

**Description:**

Alt-s03

Ephemeral Stream

Facing Downstream







## PHOTOGRAPHIC RECORD HHEI Streams

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Brownhelm Junction (Alternate Route)

**Project No.**

14950065

**Photo No. 5**

**Date:**

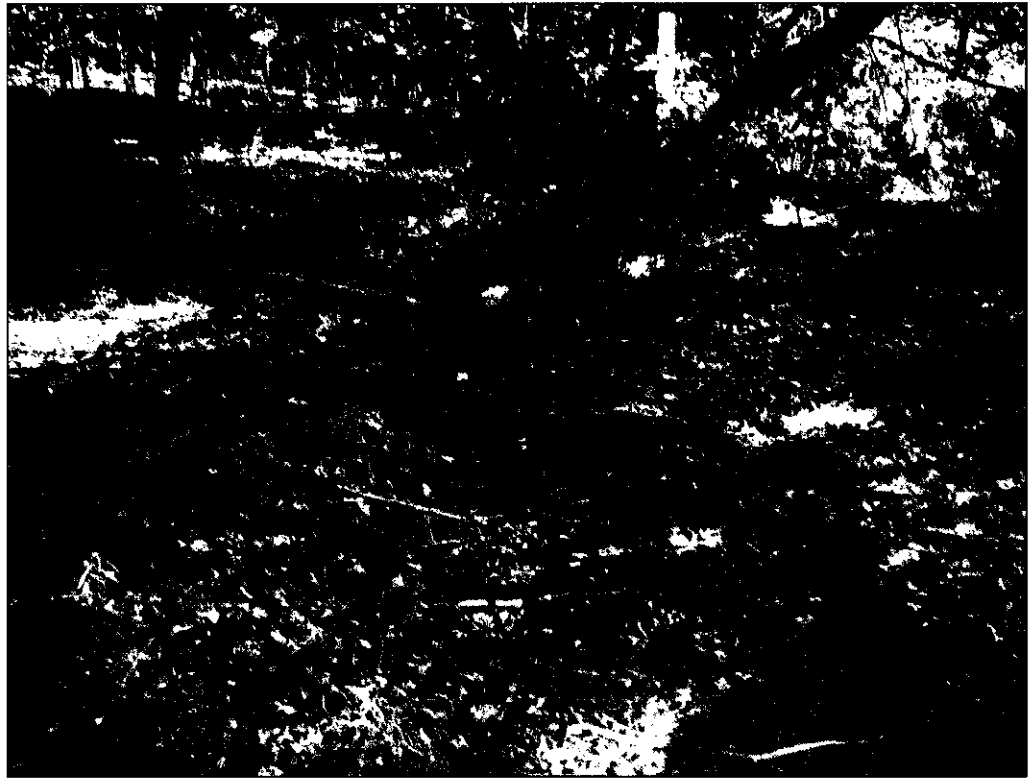
September 15, 2011

**Description:**

Alt-s04

Ephemeral Stream

Facing Downstream



**Photo No. 6**

**Date:**

September 15, 2011

**Description:**

Alt-s05

Ephemeral Stream

Facing Downstream



**E4 – PONDS**



## PHOTOGRAPHIC RECORD Ponds

**Client Name:**

FirstEnergy

**Site Location:**

Beaver-Brownhelm Junction (Preferred Route)

**Project No.**

14950065

**Photo No. 1**

**Date:**

August 30, 2011

**Description:**

Pr-p02

Facing southeast





**AVON-BEAVER #1 345 kV TRANSMISSION  
LINE RELOCATION PORTION OF THE  
BEAVER TO BROWNHELM JUNCTION 345  
kV TRANSMISSION LINE PROJECT**

**WETLAND DELINEATION AND STREAM ASSESSMENT  
REPORT**

*Prepared for:*

American Transmission Systems, Incorporated  
a subsidiary of  
FirstEnergy Corp  
76 South Main Street  
Akron, Ohio 44308

**ATSI**

**URS**

525 Vine Street, Suite 1800  
Cincinnati, Ohio 45202

July 2012

### TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
2.0	METHODOLOGY .....	1
2.1	WETLAND DELINEATION .....	2
2.1.1	SOILS .....	3
2.1.2	HYDROLOGY .....	3
2.1.3	VEGETATION .....	4
2.1.4	WETLAND CLASSIFICATIONS .....	4
2.1.5	OHIO RAPID ASSESSMENT METHOD V 5.0 .....	5
	<i>Category 1 Wetlands</i> .....	5
	<i>Category 2 Wetlands</i> .....	6
	<i>Category 3 Wetlands</i> .....	6
2.2	STREAM & RIVER CROSSINGS .....	6
2.2.1	OHIO EPA QUALITATIVE HABITAT EVALUATION INDEX .....	7
2.2.2	OHIO EPA PRIMARY HEADWATER HABITAT EVALUATION INDEX .....	7
3.0	RESULTS .....	8
3.1	WETLAND DELINEATION .....	9
3.1.1	Preliminary Soils Evaluation .....	9
3.1.2	National Wetland Inventory Map Review .....	9
3.1.3	Delineated Wetlands .....	9
3.1.4	Delineated Wetlands ORAM V5.0 Results .....	11
3.2	STREAM & RIVER CROSSINGS .....	12
3.2.1	Qualitative Habitat Evaluation Index .....	12
3.2.2	Primary Headwater Habitat Evaluation Index .....	12
3.3	PONDS .....	13
4.0	SUMMARY .....	13
5.0	REFERENCES .....	14

**TABLES****Number**

Table 1	Soil Map Units and Descriptions Within the Avon-Beaver #1 345 kV Transmission Line Relocation Project Survey Corridor
Table 2	Vegetation Identified Within the Avon-Beaver #1 345 kV Transmission Line Relocation Project Survey Corridor
Table 3	Delineated Wetlands Within the Avon-Beaver #1 345 kV Transmission Line Relocation Project Survey Corridor
Table 4	Streams Identified Within the Avon-Beaver #1 345 kV Transmission Line Relocation Project Survey Corridor

**FIGURES****Number**

1	Project Vicinity Map
2	National Wetland Inventory Map
3	Wetland Delineation and Stream Assessment Map
4	Soils Map

**APPENDICES****Appendix**

A	U.S. Army Corps of Engineers Wetland Forms
B	Ohio EPA Wetland ORAM Forms
C	Ohio EPA HHEI Stream Forms
D	Delineated Features Photographs
D1	Wetlands
D2	HHEI Streams

**LIST OF ACRONYMS**

ATSI	American Transmission Systems, Incorporated
EPA	Environmental Protection Agency
FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
GPS	Global Positioning System
HHEI	Headwater Habitat Evaluation Index
HUC	Hydrologic unit code
NRCS	National Resource Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate wetland
OHWM	Ordinary high water mark
ORAM	Ohio Rapid Assessment Method
PEM	Palustrine emergent
PHWH	Primary Headwater Habitat
PSS	Palustrine scrub/shrub
QHEI	Qualitative Habitat Evaluation Index
ROW	Right-of-way
UPL	Upland
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey



## **1.0 INTRODUCTION**

American Transmission Systems, Incorporated (“ATSI”), a subsidiary of FirstEnergy Corp., is proposing to construct approximately 2.8 miles of new 345 kV transmission line from the Beaver Substation to an existing FirstEnergy transmission line. The new transmission line will be constructed with a combination of wood and steel pole construction in the existing right-of-way. The majority of the new construction will be for the Beaver-Carlisle 345 kV Transmission Line; although immediately adjacent to the Beaver Substation it will be used for the Avon-Beaver #2 345kV Transmission Line. Several of the last 345 kV line spans connected to the Beaver substation will be swung over one bay to avoid line crossings. As a result of moving the lines over one bay, the Avon-Beaver #1 345 kV Transmission Line must be relocated. The Project is referred to as the Beaver to Brownhelm Junction 345 kV New Construction Transmission Line Project and is illustrated on Figure 1.

This portion of the Project requires relocating approximately 0.40 miles of the transmission line to the east of Beaver Substation. This portion of the Project will exit the north side of the Beaver Substation, travel north for approximately 300 feet before heading east approximately 270 feet, and finally the route heads south approximately 1,550 feet (0.29-mile) where it will tie into the existing line that continues east.

To the extent practical, ATSI has taken advantage of existing electric transmission line corridors during the planning and routing of the proposed Project. As a result, the entire portion of the proposed Project route will closely parallel the existing Beaver Substation fenceline and the existing electric transmission line corridor.

Land uses crossed by the Project 200-foot survey corridor were assigned a general classification based upon the principal land characteristics of the location as observed from within a given area, aerial photograph review, and field surveys. Four general land use types will be crossed by the proposed Project (old field, young deciduous forest, scrub/shrub uplands, and wetlands). The dominant land uses within the Project 200-foot wide survey corridor are young deciduous forest and scrub/shrub upland.

## **2.0 METHODOLOGY**

The purpose of this survey was to determine whether evidence of wetlands and “waters of the U.S.” may exist in within the project area. Prior to conducting field surveys, digital and published county Natural Resource Conservation Service (NRCS) soil surveys, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, and U.S. Geological

Survey (USGS) 7.5-minute topographic maps were reviewed as an exercise to determine the occurrence and location of potential wetland areas.

In April 2012, URS biologists walked the Project study corridor to conduct a waterbody and wetland delineation. The study corridor was determined by buffering the centerline of the proposed transmission line by 100-feet on each side, totaling a 200-foot-wide study corridor.

During field surveys, the physical boundaries of observed water features were recorded using sub-meter accurate Trimble Global Positioning System (GPS) units. The GPS data were then reviewed and edited for errors.

The field survey results presented herein apply to the existing and reasonably foreseeable site conditions at the time of our assessment. They cannot apply to site changes of which URS is unaware and has not had the opportunity to review. Changes in the condition of a property may occur with time due to natural processes or human impacts at the project site or on adjacent properties. Changes in applicable standards may also occur as a result of legislation or the expansion of knowledge over time. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond the control of URS.

## **2.1 WETLAND DELINEATION**

The Project survey corridor was evaluated according to the procedures outlined in the U.S. Army Corps of Engineers (USACE) *1987 Wetland Delineation Manual (1987 Manual)* (Environmental Laboratory, 1987) and the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Interim Regional Supplement)* (USACE, 2009). The *Interim Regional Supplement* was released in October, 2009 by the USACE to address regional wetland characteristics and improve the accuracy and efficiency of wetland delineation procedures. The *1987 Manual* and *Interim Regional Supplement* define wetlands as areas that have positive evidence of three environmental parameters: hydric soils, wetland hydrology, and hydrophytic vegetation. Wetland boundaries are placed where one or more of these parameters give way to upland characteristics.

Since quantitative data were not available for any of the identified wetlands, URS utilized the routine delineation method described in both the *1987 Manual* and the *Interim Regional Supplement* that consisted of a pedestrian site reconnaissance, including identifying the vegetation communities, soils identification, a geomorphologic assessment of hydrology, and notation of disturbance. The methodology used to examine each parameter is described in the

following sections. Completed USACE wetland delineation forms recorded for the site are provided in Appendix A.

### **2.1.1 SOILS**

Soils were examined using a hand auger to extract soil cores. These cores were examined for hydric soil characteristics. A *Munsell Soil Color Chart* (Kollmorgen Corporation, 1988) was used to identify the hue, value, and chroma of the matrix and mottles of the soils. Generally, mottled soils with a matrix chroma of two or less, or unmottled soils with a matrix chroma of one or less are considered to exhibit hydric soil characteristics (Environmental Laboratory, 1987). In sandy soils, mottled soils with a matrix chroma of three or less, or unmottled soils with a matrix chroma of two or less are considered to be hydric soils.

Six soil map units from five soil series are mapped within the limits of the Project survey corridor (USDA 2011). Table 1 provides a list of these soil map units along with their basic attributes.

According to the *Web Soil Survey* (USDA, 2011) and the Natural Resources Conservation Services Hydric Soils List of Ohio, three soil map units from three soil series within the Project survey boundary are listed as containing a hydric component.

### **2.1.2 HYDROLOGY**

The *1987 Manual* requires that an area be inundated or saturated to the surface for an absolute minimum of five percent of the growing season (areas saturated between five percent and 12.5 percent of the growing season may or may not be wetlands, while areas saturated over 12.5 percent of the growing season fulfill the hydrology requirements for wetlands). The regional supplement states that the growing season dates are determined through onsite observations of the following indicators of biological activity in a given year: (1) above-ground growth and development of vascular plants, and/or (2) soil temperature (12-in. depth of 41 degrees Fahrenheit (°F) or higher) as an indicator of soil microbial activity. Therefore, the beginning of the growing season in a given year is indicated by whichever condition occurs earlier, and the end of the growing season by whichever persists later.

The *Regional Supplement* also states that if onsite data gathering is not practical, the growing season can be approximated by the number of days between the average (five years out of ten, or 50 percent probability) date of the last and first 28°F air temperature in the spring and fall, respectively. The National Weather Service WETS data obtained from the NRCS National Water and Climate Center reveals that in an average year, this period lasts from April 16 to November

2, or 201 days. In the Project area, five percent of the growing season equates to approximately 10 days.

The soils and ground surface were examined for evidence of wetland hydrology in lieu of detailed hydrological data. This is an acceptable approach according to the *1987 Manual* and the *Regional Supplement*. Evidence indicating wetland hydrology typically includes primary indicators such as surface water, saturation, water marks, drift deposits, water-stained leaves, sediment deposits and oxidized rhizospheres on living roots; and secondary indicators such as, drainage patterns, geomorphic position, micro-topographic relief, and a positive Facultative (FAC)-neutral test (USACE, 2011).

Review of USGS watershed data indicates that the Project is located within the Black-Rocky Watershed of the Southern Lake Erie Subregion (USGS, 2011). Within this watershed, the project will cross one minor watershed: Lake Erie Tributaries East of Vermilion River and West of Black River.

### **2.1.3 VEGETATION**

Dominant vegetation was visually assessed for each stratum (tree, sapling/shrub, herb and woody vine) and an indicator status of obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and/or upland (UPL) was assigned to each plant species based on the U.S. Army Corps of Engineers North-central and Northeast Region National Wetland Plant List (2012). An area is determined to have hydrophytic vegetation when, under normal circumstances, 50 percent or more of the composition of the dominant species are OBL, FACW and/or FAC species. Vegetation of an area was determined to be non-hydrophytic when more than 50 percent of the composition of the dominant species was FACU and/or UPL species. In addition to the dominance test, the FAC-Neutral test and prevalence tests are used to determine if a wetland has a predominance of hydrophytic vegetation. Table 2 lists the vegetation that was identified in delineated wetlands during field surveys.

### **2.1.4 WETLAND CLASSIFICATIONS**

Wetlands were classified based on the naming convention found in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin *et al*, 1979). All identified wetlands within the survey corridor were classified as freshwater, Palustrine Systems, which includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens. Three Palustrine wetland classes were identified in the Project survey corridor. The three classes are as follows:

- **PEM** – Emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.
- **PSS** – Scrub/shrub wetlands are characterized by woody vegetation that is less than 3 inches diameter at breast height (DBH), and greater than 3.28 feet tall. The woody angiosperms (i.e. small trees or shrubs) in this broad leaved deciduous community have relatively wide, flat leaves that are shed annually during the cold or dry season.
- **PFO** – Forested wetlands are characterized by woody vegetation that is 3 inches or more DBH, regardless of height. The woody angiosperms (i.e. trees or shrubs) in this broad leaved deciduous community have relatively wide, flat leaves that are shed annually during the cold or dry season.

### **2.1.5 OHIO RAPID ASSESSMENT METHOD V 5.0**

The Ohio Environmental Protection Agency (Ohio EPA) Ohio Rapid Assessment Method for Wetlands v. 5.0 (ORAM) was developed to determine the relative ecological quality and level of disturbance of a particular wetland in order to meet requirements under Section 401 of the Clean Water Act. Wetlands are scored on the basis of hydrology, upland buffer, habitat alteration, special wetland communities, and vegetation communities. Each of these subject areas is further divided into subcategories under ORAM v5.0 resulting in a score that describes the wetland using a range from 0 (low quality and high disturbance) to 100 (high quality and low disturbance). Wetlands scored from 0 to 29.9 are grouped into "Category 1", 30 to 59.9 are "Category 2" and 60 to 100 are "Category 3". Transitional zones exist between "Categories 1 and 2" from 30 to 34.9 and between "Categories 2 and 3" from 60 to 64.9. However, according to the OEPA, if the wetland score falls into the transitional range, it must be given the higher Category unless scientific data can prove it should be in a lower category (Mack, 2001). The ORAM scores for the wetlands that were delineated are discussed in Section 3.1.4 of this report.

#### ***Category 1 Wetlands***

Category 1 wetlands support minimal wildlife habitat, hydrological and recreational functions, and do not provide for or contain critical habitats for threatened or endangered species. In addition, Category 1 wetlands are often hydrologically isolated and have some or all of the following characteristics: low species diversity, no significant habitat or wildlife use, limited potential to achieve wetland functions, and/or a predominance of non-native species. These limited quality wetlands are considered to be a resource that has been severely degraded or has a limited potential for restoration, or is of low ecological functionality.

***Category 2 Wetlands***

Category 2 wetlands "...support moderate wildlife habitat, or hydrological or recreational functions," and as wetlands which are "...dominated by native species but generally without the presence of, or habitat for, rare, threatened or endangered species; and wetlands which are degraded but have a reasonable potential for reestablishing lost wetland functions." Category 2 wetlands constitute the broad middle category of "good" quality wetlands, and can be considered a functioning, diverse, healthy water resource that has ecological integrity and human value. Some Category 2 wetlands are lacking in human disturbance and considered to be naturally of moderate quality; others may have been Category 3 wetlands in the past, but have been degraded to Category 2 status.

***Category 3 Wetlands***

Wetlands that are assigned to Category 3 have "...superior habitat, or superior hydrological or recreational functions." They are typified by high levels of diversity, a high proportion of native species, and/or high functional values. Category 3 wetlands include wetlands which contain or provide habitat for threatened or endangered species, are high quality mature forested wetlands, vernal pools, bogs, fens, or which are scarce regionally and/or statewide. It is important to stress that a wetland may be a Category 3 wetland because it exhibits one or all of the above characteristics. For example, a forested wetland located in the flood plain of a river may exhibit "superior" hydrologic functions (e.g. flood retention, nutrient removal), but not contain mature trees or high levels of plant species diversity.

**2.2 STREAM & RIVER CROSSINGS**

Regulatory activities under the Clean Water Act provide authority for states to issue water quality standards and "designated uses" to all waters of the U.S. upstream to the highest reaches of the tributary streams. In addition, the Federal Water Pollution Control Act of 1972 and its 1977 and 1987 amendments require knowledge of the potential fish or biological communities that can be supported in a stream or river, including upstream headwaters. Streams were identified by the presence of a defined bed and bank, and/or evidence of an ordinary high water mark (OHWM).

Stream assessments were conducted using the methods described in the Ohio EPA's Methods for Assessing Habitat in Flowing Waters: Using Ohio EPA's *Qualitative Habitat Evaluation Index* (Rankin, 2006) and *Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams, version 1* (Davic, 2002).

### **2.2.1 OHIO EPA QUALITATIVE HABITAT EVALUATION INDEX**

The qualitative habitat evaluation index (QHEI) is designed to provide a rapid determination of habitat features that correspond to those physical factors that most affect fish communities and which are generally important to other aquatic life (*e.g.*, macroinvertebrates). The quantitative measure of habitat used to calibrate the QHEI score are Indices (or Index) of Biotic Integrity (IBI) for fish. In most instances the QHEI is sufficient to give an indication of habitat quality, and the intensive qualitative analysis used to measure the IBI is not necessary. It is the IBI, rather than the QHEI, that is directly correlated with the aquatic life use designation for a particular surface water.

The QHEI method is generally considered appropriate for waterbodies with drainage basins greater than one square mile, if natural pools are greater than 40 cm, or if the water feature is shown as “blue-line” waterways on USGS 7.5-minute topographic quadrangle maps. In order to convey general stream habitat quality to the regulated public, the Ohio EPA has assigned narrative ratings to QHEI scores. The ranges vary slightly for headwater streams (H are those with a watershed area less than or equal to 20 square miles) versus larger streams (L are those with a watershed area greater than 20 square miles). The Narrative Rating System includes: Very Poor (<30 H and L), Poor (30 to 42 H, 30 to 44 L), Fair (43 to 54 H, 45 to 59 L), Good (55 to 69 H, 60 to 74 L) and Excellent (70+ H, 75+ L). Results of the QHEI assessments are discussed in Section 3.2.1 of this report.

### **2.2.2 OHIO EPA PRIMARY HEADWATER HABITAT EVALUATION INDEX**

Headwater streams are typically considered to be first-order and second-order streams, meaning streams that have no upstream tributaries (or “branches”) and those that have only first-order tributaries, respectively. The stream order concept can be problematic when used to define headwater streams because stream-order designations vary depending upon the accuracy and resolution of the stream delineation. Headwater streams are generally not shown on USGS 7.5-minute topographic quadrangles and are sometimes difficult to distinguish on aerial photographs. Nevertheless, headwater streams are now recognized as useful monitoring units due to their abundance, widespread spatial scale and landscape position (Fritz, et al. 2006). Impacts to headwater streams can have a cascading effect on the downstream water quality and habitat value. The headwater habitat evaluation index (HHEI) is a rapid field assessment method for physical habitat that can be used to appraise the biological potential of most Primary Headwater Habitat (PHWH) streams. The HHEI was developed using many of the same techniques as used for QHEI, but has criteria specifically designed for headwater habitats. To use HHEI, the stream must have a “defined bed and bank, with either continuous or periodically flowing water, with

watershed area less than or equal to 1.0 mi<sup>2</sup> (259 ha), and a maximum depth of water pools equal to or less than 15.75 inches (40 cm)" (Davic, 2002).

Headwater streams are scored on the basis of channel substrate composition, bankfull width, and maximum pool depth. Assessments result in a score (0 to 100) that is converted to a specific PHWH stream class. Streams that are scored from 0 to 29.9 are typically grouped into "Class 1 PHWH Streams", 30 to 69.9 are "Class 2 PHWH Streams", and 70 to 100 are "Class 3 PHWH Streams". Technically, a stream can score relatively high, but actually belong in a lower class, and vice-versa. According to the OEPA, if the stream score falls into a class and the scorer feels that based on site observations that score does not reflect the actual stream class, a decision-making flow chart can be used to determine appropriate PHWH stream class using the HHEI protocol (Davic, 2002). Evidence of anthropogenic alterations to the natural channel will result in a "Modified" qualifier for the stream. Results of HHEI assessed streams are discussed in Section 3.2.2 of this report.

***Class 1 PHWH Streams:*** Class 1 PHWH Streams are those that have "normally dry channels with little or no aquatic life present" (Davic, 2002). These waterways are usually ephemeral, with water present for short periods of time due to infiltration from snowmelts or rainwater runoff.

***Class 2 PHWH Streams:*** Class 2 PHWH Streams are equivalent to "warm-water habitat" streams. This stream class has a "moderately diverse community of warm-water adapted native fauna either present seasonally or on an annual basis" (Davic, 2002). These species communities are composed of vertebrates (fish and amphibians i.e., salamanders and frogs) and/or benthic macroinvertebrates that are considered pioneering, headwater temporary, and/or temperature facultative species.

***Class 3 PHWH Streams:*** Class 3 PHWH Streams usually have perennial water flow with cool-cold water adapted native fauna. The community of Class 3 PHWH Streams is comprised of vertebrates (either cold water adapted species of headwater fish and or obligate aquatic species of salamanders, with larval stages present), and/or a diverse community of benthic cool water adapted macroinvertebrates present in the stream continuously (on an annual basis).

Results of the HHEI assessments are discussed in Section 3.2.2 of this report.

### **3.0 RESULTS**

Within the 200-foot study corridor, URS delineated six wetlands and four streams. These wetlands and other water features are discussed in detail in the following sections.



### **3.1 WETLAND DELINEATION**

The locations, approximate extents, and acreages of the wetlands delineated within the Project 200-foot survey corridor are shown on Figure 3. Completed USACE wetland delineation forms are provided in Appendix A. Color photographs were taken of each delineated wetland during the field survey and are provided in Appendix D1.

#### **3.1.1 Preliminary Soils Evaluation**

According to the *Web Soil Survey* for Lorain County, Ohio (USDA, 2011) and the Natural Resources Conservation Services Hydric Soils List of Ohio, six soil series are mapped within the 200-foot survey corridor, and include three soil series with hydric soil map units (USDA, 2011). Soils in each wetland were observed and documented as part of the delineation methodology. Soil series located within the project area are shown on Figure 4. Table 1 provides a detailed overview of all soil series within the 200-foot survey corridor.

#### **3.1.2 National Wetland Inventory Map Review**

National Wetland Inventory (NWI) wetlands are areas of potential wetland that have been identified from USFWS aerial photograph interpretation which have typically not been field verified. Forested and heavy scrub/shrub wetlands are often not shown on NWI maps as foliage effectively hides the visual signature that indicates the presence of standing water and moist soils from an aerial view. The USFWS website states that the NWI maps are not intended or designed for jurisdictional wetland identification or location. As a result, NWI maps do not show all the wetlands found in a particular area nor do they necessarily provide accurate wetland boundaries. NWI maps are useful for providing indications of potential wetland areas, which are often supported by soil mapping and hydrologic predictions, based upon topographical analysis using USGS topographic maps.

According to the NWI map of the East Vermilion, Ohio quadrangle, the survey corridor contains no mapped NWI wetlands.

#### **3.1.3 Delineated Wetlands**

The wetland delineation identified six wetlands, totaling 0.76 acres, within the 200-foot survey corridor (Table 3.1.3). Do note that some wetland boundaries extend beyond the 200-foot survey corridor, but only what was within the study corridor was assessed. See Table 3.1.3 for a summary of the delineated wetlands.

The locations, approximate extents, and acreages of the wetlands identified within the Project 200-foot survey corridor are shown on Figure 3. Completed USACE wetland delineation forms are provided in Appendix A. Color photographs were taken of each delineated wetland during the field survey and are provided in Appendix D1.

**TABLE 3.1.3**  
**SUMMARY OF DELINEATED WETLANDS WITHIN THE AVON-BEAVER #1 345 kV**  
**TRANSMISSION LINE RELOCATION PROJECT SURVEY CORRIDOR**

Cowardin Wetland Type	Number of Wetlands	Category 1	Category 2	Category 3	Acreage within 200-Foot Survey Corridor	Approximate Length Crossed by Centerline (feet)
PSS	1	1	0	0	0.01	Not Crossed
PFO	2	0	2	0	0.35	47
PFO/PSS	1	0	1	0	0.12	Not Crossed
PFO/PSS/PEM	2	1	1	0	0.28	37
<b>Totals:</b>	<b>6</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>0.76</b>	<b>84</b>

### 3.1.4 Delineated Wetlands ORAM V5.0 Results

Within the Project 200-foot survey corridor, two of the six wetlands are Category 1 wetlands, and the remaining four wetlands are Category 2 wetlands. No Category 3 wetlands were crossed by the 200-foot survey corridor. Wetland AB-w05a had the lowest ORAM score, 25, and Wetland AB-w03 had the highest score, 57. Completed ORAM forms for the wetlands are provided in Appendix B.

#### *Category 1 Wetlands*

The two Category 1 wetlands totaling 0.14 acre within the 200-foot survey corridor include: one PSS wetland and one PFO/PSS/PEM wetland. The highest scoring Category 1 wetland was 27 (Wetland AB-w01), and the lowest was 25 (Wetland AB-w05a). These wetlands exhibited narrow upland buffers and intensive use of adjacent upland areas, exhibited limited plant community development with a moderate to high percentage of invasive species, and characteristically had habitat and hydrology in the early stages of recovering from previous manipulation because of farming or other disturbances.

#### *Category 2 Wetlands*

The four Category 2 wetlands totaling 0.62 acres delineated within the 200-foot survey corridor include: two PFO wetlands, one PFO/PSS wetland, and one PFO/PSS/PEM wetland. The highest scoring Category 2 wetland was 57 (Wetland AB-w03), and the lowest was 40 (Wetland AB-w02). Category 2 wetlands with dominant forested and mixed emergent, scrub/shrub,

forested plant communities were identified within the survey corridor. Category 2 wetlands generally exhibited moderate to high quality plant communities with few invasive species, moderate to good plant community interspersions, low to high intensity surrounding land use (e.g. young second growth woodlots, shrub-land, etc.), and recovered and/or no modification to natural hydrology and habitat.

### ***Category 3 Wetlands***

No Category 3 wetlands were identified within the 200-foot survey corridor.

## **3.2 STREAM & RIVER CROSSINGS**

Streams within the 200-foot survey corridor are provided in Table 4. The locations of streams identified within the 200-foot survey corridor are shown on Figure 3.

Within the 200-foot survey corridor, four streams were assessed; three ephemeral (1,340 linear feet) and one intermittent (17 linear feet) streams. All streams were assessed using the HHEI methodology (drainage area less than 1 mi<sup>2</sup>).

URS has preliminarily determined the four streams appear to be jurisdictional (i.e., waters of the U.S.).

### **3.2.1 Qualitative Habitat Evaluation Index**

No QHEI streams were identified within the 200-foot survey corridor.

### **3.2.2 Primary Headwater Habitat Evaluation Index**

Field surveys along the survey corridor identified four primary headwater streams: two Class 1 streams, one Modified Class 1 stream, and one Modified Class 2 stream. Completed HHEI forms are provided in Appendix C. Color photographs were taken of each stream during the field survey and are provided in Appendix D2.

***Class 1 Headwater Streams*** – Two Class 1 headwater streams totaling 859 linear feet were identified during field surveys, with scores ranging from 15 to 19. Both of the streams were ephemeral, and the dominant substrates generally consisted of clay, silt, and muck, with lesser amounts of cobble, gravel and sand. The maximum pool depth was approximately one inch, and the maximum bank full width was approximately 2.3 feet.

***Modified Class 1 Headwater Streams*** - One Modified Class 1 headwater stream totaling 481 linear feet was identified during the field surveys, and received a score of 19. The stream was ephemeral, and the dominant substrates were gravel and clay, with lesser amounts of sand, muck, and artificial substrate. The maximum pool depth was approximately 0.5 inch, and the bank full width was approximately 1.5 feet. The stream contained evidence of stream channel modifications (e.g. channelization, culverting, etc.). These modifications resulted in this stream receiving a Modified Class 1 designation.

***Modified Class 2 Headwater Streams*** - One Modified Class 2 headwater stream totaling 17 linear feet was identified during the field investigation, and received a score of 34. The stream was intermittent, and the dominant substrates were gravel and clay, with lesser amounts of cobble, sand, and silt. The maximum pool depth was approximately three inches, and the bank full width was approximately 3 feet.

### **3.3 PONDS**

No ponds were identified within the 200-foot survey corridor.

## **4.0 SUMMARY**

During the field survey, a total of six wetlands totaling 0.76 acre were assessed within the 200-foot survey corridor. These wetlands are of four different wetland habitat types: one PSS wetland, two PFO wetlands, one PFO/PSS wetland, and two PFO/PSS/PEM wetlands. Within the Project 200-foot survey corridor, two of the six wetlands are Category 1 wetlands, and the remaining four wetlands are Category 2 wetlands.

Within the 200-foot survey corridor, four streams were assessed: three ephemeral (1,340 linear feet) and one intermittent (17 linear feet) streams. All streams were assessed using the HHEI methodology (drainage area less than 1 mi<sup>2</sup>). The ephemeral streams received scores ranging from 15 to 19 and were classified as Class 1 and Modified Class 1 Headwater streams. The intermittent stream received a score of 34 and was classified as a Modified Class 2 Headwater stream.

## **5.0 REFERENCES**

- Cowardin, L.M., V. Carter, F.C. Golet and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Office of Biological Services, U.S. Fish and Wildlife Service, Washington, D.C.
- Davic, Robert D. 2002. *Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams. Final Version 1.0*. Ohio Environmental Protection Agency, Division of Surface Water, Columbus, Ohio.
- Environmental Laboratory. 1987. U.S. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station: Vicksburg, Mississippi.
- Fritz, K.M., Johnson, B.R., and Walters, D.M. 2006. Field Operations Manual for Assessing the Hydrologic Permanence and Ecological Condition of Headwater Streams. EPA/600/ R-06/126. U.S. Environmental Protection Agency, Office of Research and Development, Washington DC.
- Kollmorgen Corporation. 1988. Munsell Soil Color Charts. Baltimore, Maryland.
- Mack, John J. 2001. *Ohio Rapid Assessment Method for Wetlands v. 5.0, User's Manual and Scoring Forms. Ohio EPA Technical Report WET/2001-1*. Ohio Environmental Protection Agency, Division of Surface Water, 401/Wetland Ecology Unit, Columbus, Ohio.
- Rankin, Edward T. 2006. *Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI)*. Ohio EPA Ecological Assessment Section, Division of Surface Water, Columbus, Ohio.
- U.S. Army Corps of Engineers. 2009. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-09-19. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 1970. Soil Survey of Lorain County, Ohio. 99 p.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 2011. National Hydric Soils List. <http://soils.usda.gov/use/hydric/> Accessed 11/15/11
- U.S. Department of Agriculture, Natural Resources Conservation Service. 2012. National Weather Service- Wetland Climate Evaluation Database (WETS Table). <http://www.wcc.nrcs.usda.gov/climate/wetlands.html> Accessed 01/10/12

U.S. Fish and Wildlife Service. 1983. *National Wetlands Inventory Map*. Vermilion East, Ohio quadrangle.

U.S. Geological Survey (USGS). 2009. Water Resources of the United States – Boundary Descriptions and Names of Regions, Subregions, Accounting Units and Cataloging Units. [http://water.usgs.gov/GIS/huc\\_name.html](http://water.usgs.gov/GIS/huc_name.html). Accessed 4/05/10.

TABLE 1

## SOIL MAP UNITS AND DESCRIPTIONS WITHIN THE AVON-BEAVER #1 345 KV TRANSMISSION LINE RELOCATION PROJECT STUDY CORRIDOR

Soil Series	Symbol	Map Unit Description	Percent of Route by Series	Topographic Setting	Hydric	Hydric Component (%)
Ellsworth	EID2	Ellsworth silt loam, 12 to 18 percent slopes, moderately eroded	21	Areas along major drainageways	no	n/a
Fulton	FuA	Fulton silt loam, 0 to 2 percent slopes	23	Areas that parallel the shore of Lake Erie	no	n/a
Haskins	HaA	Haskins loam, 0 to 2 percent slopes	35	Depressions	Inclusions	Merrill (3)
Haskins	HaB	Haskins loam, 2 to 6 percent slopes	9	Remnants of beach ridges and along drainageways	no	n/a
Holly	Hy	Holly silt loam	12	Flood plains	Yes	Holly (95)
Miner	Mr	Miner silty clay loam	0.003	Depressions	Yes	Miner (85), Lunny (3), Lorain (3), Trumbull (3), other areas (3)

## NOTES:

(1) Percentages do not add up to exactly 100% due to rounding

(2) Data sources include:

USDA, NRCS. 2011 Soil Survey Geographic (SSURGO) Database. Available online at: <http://soildatamart.nrcs.usda.gov/>USDA, NRCS. October 2011. National Hydric Soils List by State. Available online at: <http://soils.usda.gov/use/hydric/soils/state.html>

USDA, NRCS. 1976. Soil Survey of Lorain County, Ohio.

Table 1

ATSI



TABLE 2

## VEGETATION IDENTIFIED WITHIN THE AVON-BEAVER #1 345 kV TRANSMISSION LINE RELOCATION PROJECT SURVEY CORRIDOR

Common Name	Scientific Name	Stratum <sup>a</sup>	Northeastern / Northcentral Region Indicator Status <sup>b</sup>
American Sycamore	<i>Platanus occidentalis</i>	T/S	FACW
Ash-Leaf Maple	<i>Acer negundo</i>	T/S	FAC
Black Willow	<i>Salix nigra</i>	T/S	OBL
Cottongrass Bulrush	<i>Scirpus cyperinus</i>	H	OBL
Eastern Cottonwood	<i>Populus deltoides</i>	T/S	FAC
Green Ash	<i>Fraxinus pennsylvanica</i>	T/S	FACW
Hawthorn	<i>Crataegus sp.</i>	S	FAC
Lamp Rush	<i>Juncus effusus</i>	H	OBL
Red Maple	<i>Acer rubrum</i>	T/S	FAC
Red Osier	<i>Cornus alba</i>	S	FACW
Sedge	<i>Carex sp.</i>	H	FAC
Southern Arrow-Wood	<i>Viburnum dentatum</i>	S	FAC
Swamp Rose	<i>Rosa palustris</i>	S	OBL

<sup>a</sup> H = herb, S = shrub or sapling, T = tree, V = vine<sup>b</sup> Wetland Indicator Status for USACE Northeastern / Northcentral Region (includes the entire project area)

OBL - Obligate Wetland - Occurs almost always (99% probability) in wetlands

FACW - Facultative Wetlands - Usually occurs in wetlands (67 - 99% probability)

FAC - Facultative - Equally likely to occur in wetlands or non-wetlands (34 - 66% probability)

FACU - Facultative Upland - Usually occurs in non-wetlands (67 - 99% probability)

UPL - Obligate Upland - Occurs almost always in non-wetlands (99% probability)

**TABLE 3**  
**DELINEATED WETLANDS WITHIN THE AVON-BEAVER #1 345 kV TRANSMISSION LINE**  
**RELOCATION PROJECT SURVEY CORRIDOR**

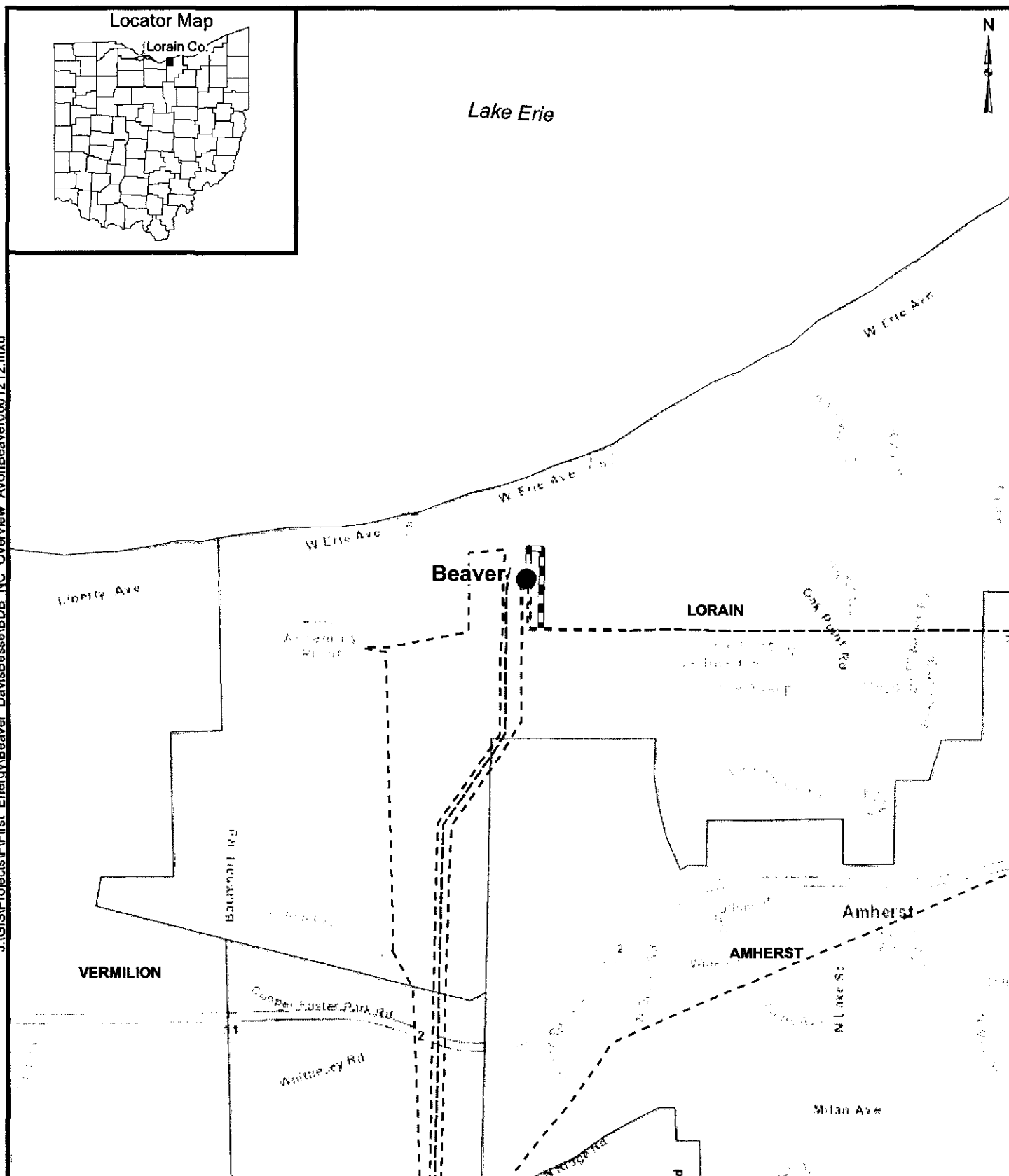
<b>Report Name</b>	<b>Cowardin Wetland Type<sup>a</sup></b>	<b>ORAM Score</b>	<b>ORAM Category</b>	<b>Acreage within 200 Foot Corridor</b>	<b>Approximate Length Crossed by Centerline (feet)</b>
AB-w01	PSS	27	1	0.01	Not Crossed
AB-w02	PFO/PSS	40	2	0.12	Not Crossed
AB-w03	PFO	57	2	0.32	47
AB-w04	PFO	46.5	2	0.03	Not Crossed
AB-w05a	PFO/PSS/PEM	25	1	0.13	26
AB-w05b	PFO/PSS/PEM	54	2	0.15	11
<b>TOTAL</b>	<b>6</b>			<b>0.76</b>	<b>84</b>

<sup>a</sup> Wetland Type: PEM – palustrine emergent, PSS – palustrine scrub/shrub, PFO – palustrine forested.

**TABLE 4**  
**STREAMS IDENTIFIED WITHIN THE AVON-BEAVER #1 345 kV TRANSMISSION LINE RELOCATION PROJECT SURVEY CORRIDOR**

Stream Name	Flow Type	Estimated Width of Stream Crossing (feet)	Maximum Pool Depth (inches)	Approximate Length Within Survey Corridor (feet)	Assessment Used	Score	Narrative Description
AB-s01	Ephemeral	1.5	0.5	481	HHEI	19	Modified Class I
AB-s02	Intermittent	3	3	17	HHEI	34	Modified Class II
AB-s03	Ephemeral	2.3	1	360	HHEI	19	Class I
AB-s04	Ephemeral	2	1	499	HHEI	15	Class I
<b>Total:</b>				<b>1,357</b>			

J:\GIS\Projects\First\_Energy\Beaver\_DavisBesse\BDB\_NC\_Overview\_AvonBeaver0601212.mxd



**LEGEND:**

- Beaver Substation
- Avon-Beaver Route Centerline
- - - Existing FirstEnergy Transmission Line
- City Boundary

0 0.5 1

Scale In Miles

BASE MAP SOURCE:  
ArcGIS Map Service  
<http://goto.arcgisonline.com/maps>  
World Street Map

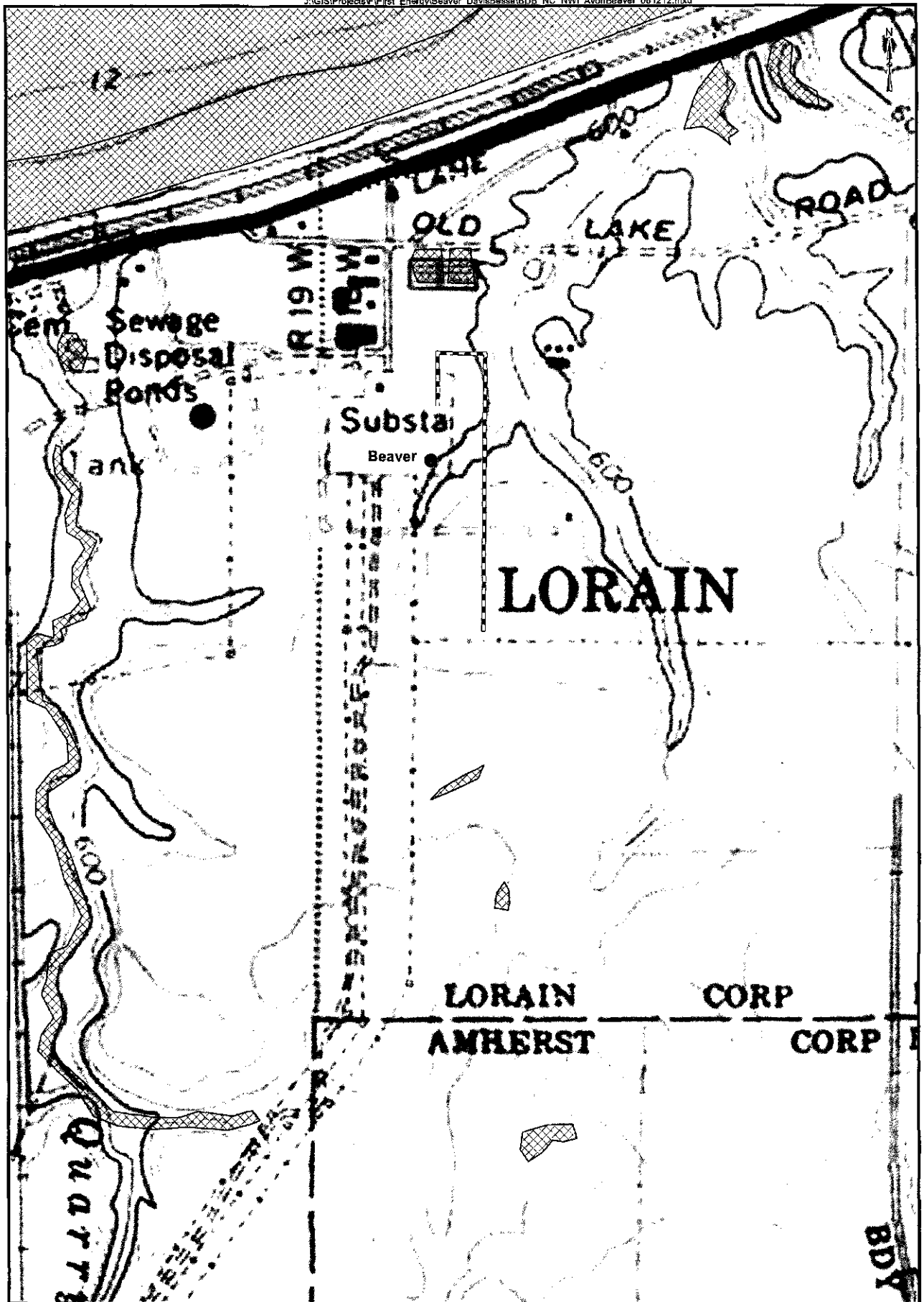
**ATSI**

Avon - Beaver  
345kV Transmission Line  
Relocation

**FIGURE 1  
PROJECT VICINITY MAP**

JOB NO. 14950065

**URS**



**LEGEND:**

- Beaver Substation
- Avon-Beaver Route Centerline
- Avon-Beaver 2,000 Foot Corridor
- ▨ National Wetland Inventory

0 500 1,000

Scale In Feet

BASE MAP SOURCE:  
USGS 7.5-minute Topographic Quadrangle-  
Vermilion East

\*National Wetland Inventory Source-  
<http://107.20.228.18/Wetlands/WetlandsMapper.html>

**ATSI.**

Avon - Beaver  
345kV Transmission Line  
Relocation

**FIGURE 2  
NATIONAL WETLAND  
INVENTORY MAP**

JOB NO. 14950085

**URS**