

US EPA ARCHIVE DOCUMENT

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(FRONT)**

STREAM NAME <u>Abercrombie Run</u>	LOCATION <u>TPSD - TT3001</u>
STATION # <u>TT3001</u> / RIVERMILE _____	STREAM CLASS _____
LAT _____ LONG _____	RIVER BASIN _____
STORET # _____	AGENCY _____
INVESTIGATORS <u>Roberts, O'Neill</u>	
FORM COMPLETED BY <u>Roberts</u>	DATE <u>6/22/01</u> TIME <u>1:30</u> AM <input checked="" type="radio"/> PM
	REASON FOR SURVEY <u>Triad Sampling</u>

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <u>heavy rain</u>
	<input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input checked="" type="checkbox"/> 40% cloud cover <input type="checkbox"/> clear/sunny	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> 100% <input type="checkbox"/>	Air Temperature <u>75°F</u> Other _____

6/17  
6/20

SITE LOCATION/MAP	<p>Draw a map of the site and indicate the areas sampled (or attach a photograph)</p>
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STREAM CHARACTERIZATION	Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal	Stream Type <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater
	Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Non-glacial montane <input type="checkbox"/> Swamp and bog	Catchment Area _____ km <sup>2</sup> <input type="checkbox"/> Spring-fed <input checked="" type="checkbox"/> Mixture of origins <input type="checkbox"/> Other _____

TT3001

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> <input type="checkbox"/> Forest <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input checked="" type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industrial (light) <input type="checkbox"/> Other _____	<b>Local Watershed NPS Pollution</b> <input type="checkbox"/> No evidence <input type="checkbox"/> Obvious sources <input type="checkbox"/> Some potential sources
<b>RIPARIAN VEGETATION (18 meter buffer)</b>	<b>Local Watershed Erosion</b> <input type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy	
<b>INSTREAM FEATURES</b>	Indicate the dominant type and record the dominant species present <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbaceous dominant species present <u>willow, red maple, elderberry, purple loosestrife, tussock sed.</u>	
<b>LARGE WOODY DEBRIS</b>	<b>Estimated Reach Length</b> _____ m <b>Estimated Stream Width</b> <u>5 ft</u> <b>Sampling Reach Area</b> <u>10 ft<sup>2</sup></u> <b>Area in km<sup>2</sup> (m<sup>2</sup> x 1000)</b> _____ km <sup>2</sup> <b>Estimated Stream Depth</b> <u>3-10"</u> <b>Surface Velocity (at thalweg)</b> <u>moderate</u> m/sec <u>Chain. Low flow @ 50%</u>	<b>Canopy Cover</b> <input type="checkbox"/> Partly open <input type="checkbox"/> Partly shaded <input checked="" type="checkbox"/> Shaded <u>open</u> <b>High Water Mark</b> _____ m <u>water level high</u> <b>Proportion of Reach Represented by Stream Morphology Types</b> <input type="checkbox"/> Run <u>0</u> % <input checked="" type="checkbox"/> Pool <u>50</u> % <input type="checkbox"/> Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>AQUATIC VEGETATION</b>	<b>LWD</b> _____ m <u>590</u> <b>Density of LWD</b> _____ m <sup>2</sup> /km <sup>2</sup> (LWD/Reach area)	
<b>WATER QUALITY</b>	Indicate the dominant type and record the dominant species present <input checked="" type="checkbox"/> Rooted emergent <input type="checkbox"/> Floating Algae <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Attached Algae <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating dominant species present <u>few Ludwigia palustris</u> Portion of the reach with aquatic vegetation <u>10%</u>	
<b>SEDIMENT/SUBSTRATE</b>	<b>Temperature</b> <u>21.65°C</u> <b>Specific Conductance</b> <u>346.00</u> <b>Dissolved Oxygen</b> <u>5.46</u> <b>pH</b> <u>7.49</u> <b>Turbidity</b> <u>5.0 NTU</u> <b>WQ Instrument Used</b> <u>YSI</u> <u>ORP -49.1</u>	
	<b>Water Odors</b> <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Fishy <input type="checkbox"/> Chemical <input type="checkbox"/> Other _____	<b>Water Surface Oils</b> <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____
	<b>Odors</b> <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Other _____	<b>Deposits</b> <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Relict shells <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand <input type="checkbox"/> Other <u>None</u>
	<b>Oils</b> <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse	
	<b>Looking at stones which are not deeply embedded, are the undersides black in color?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	50
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	50
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	10%	Marl	grey, shell fragments	60%
Silt	0.004-0.06 mm	90%			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <i>Aberjona River</i>	LOCATION <i>IPSD-TT3001 - South of Sullivan St</i>
STATION # <i>30-01</i> RIVERMILE _____	STREAM CLASS _____
LAT _____ LONG _____	RIVER BASIN _____
STORET # _____	AGENCY _____
INVESTIGATORS <i>Roberts, O'Neill, Hoskins on 6/21</i>	
FORM COMPLETED BY <i>Roberts</i>	DATE <i>6/22/01</i> TIME <i>1:30 AM</i> (PM) REASON FOR SURVEY <i>Triad sampling</i>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover <i>11</i>	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate Characterization <i>14</i>	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Variability <i>6</i>	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition <i>5</i>	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status <i>18</i>	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Parameters to be evaluated in sampling reach

*Some Substrate pools more than 100%...*

*Sample 1 no positive black muck deposits and some brown muck with some brown roots/peat*

773001

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration  17	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 (17) 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity  15	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 (17) 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 9 (LB)	Left Bank 10 (9)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
SCORE 9 (RB)	Right Bank 10 (9)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
9. Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 10 (LB)	Left Bank 10	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
SCORE 10 (RB)	Right Bank 10	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE 12 (LB)	Left Bank 10 9	8 7 (6)	5 4 3	2 1 0
SCORE 10 (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0

Total Score 140

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(FRONT)**

STREAM NAME <u>Phillips Pond</u>	LOCATION <u>IPSD-PP03</u>	
STATION # <u>PP03</u> RIVERMILE _____	STREAM CLASS _____	
LAT _____ LONG _____	RIVER BASIN _____	
STORET # _____	AGENCY _____	
INVESTIGATORS <u>Roberts, O'Neill,</u>		
FORM COMPLETED BY <u>Roberts</u>	DATE <u>6/25/01</u> TIME <u>10:10</u> <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	REASON FOR SURVEY <u>Triad Sampling</u>

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input checked="" type="checkbox"/> 20% showers (intermittent) <input type="checkbox"/> %cloud cover <input type="checkbox"/> clear/sunny	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> 90%	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <u>5 showers 6/25</u> Air Temperature <u>76° F</u> Other _____

SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph)
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STREAM CHARACTERIZATION	Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal	Stream Type <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater
	Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed <input type="checkbox"/> Non-glacial montane <input type="checkbox"/> Mixture of origins <input type="checkbox"/> Swamp and bog <input checked="" type="checkbox"/> Other _____	Catchment Area _____ km <sup>2</sup>

PP03

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(BACK)

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> <input checked="" type="checkbox"/> Forest <i>buffer</i> <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input checked="" type="checkbox"/> Other <i>Highway</i>	<b>Local Watershed NPS Pollution</b> <input type="checkbox"/> No evidence <input checked="" type="checkbox"/> Obvious sources <input checked="" type="checkbox"/> Some potential sources <i>highway/commercial facilities</i> <b>Local Watershed Erosion</b> <input type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy <i>potential sources</i>
<b>RIPARIAN VEGETATION</b> (18 meter buffer) <i>~ 80m wide</i>	Indicate the dominant type and record the dominant species present <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous dominant species present <i>red maple, buckthorn (collected), jewelweed</i>	
<b>INSTREAM FEATURES</b> <i>meas. from top width of pond</i>	Estimated Reach Length <i>1</i> m Estimated Stream Width <i>2.00ft</i> Sampling Reach Area <i>208ft<sup>2</sup></i> Area in km <sup>2</sup> (m <sup>2</sup> x1000) _____ km <sup>2</sup> Estimated Stream Depth <i>13.9ft</i> Surface Velocity <i>0</i> m/sec	Canopy Cover <input type="checkbox"/> Partly open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded <i>open</i> High Water Mark <i>Near high water level</i> Proportion of Reach Represented by Stream Morphology Types <input type="checkbox"/> Riffle _____ % <input checked="" type="checkbox"/> Pool <i>100</i> % <input type="checkbox"/> Run _____ % Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>Beaver dam at outlet</i>
<b>LARGE WOODY DEBRIS</b>	LWD _____ m <sup>2</sup> Density of LWD _____ m <sup>2</sup> /km <sup>2</sup> (LWD/ reach area) <i>0% none</i>	
<b>AQUATIC VEGETATION</b>	Indicate the dominant type and record the dominant species present <input type="checkbox"/> Rooted emergent <input type="checkbox"/> Floating Algae <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Attached Algae <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating dominant species present <i>NONE</i> Portion of the reach with aquatic vegetation _____ % <i>0%</i>	
<b>WATER QUALITY</b> <i>Taken at -6' or 7ft above sed.</i>	Temperature <i>17.0</i> °C Specific Conductance <i>476.0</i> µS/cm Dissolved Oxygen <i>0.74</i> mg/L pH <i>6.68</i> Turbidity <i>2.3</i> NTU WQ Instrument Used <i>YSI - 87.6mV</i>	<b>Water Odors</b> <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Fishy <input type="checkbox"/> Chemical <input type="checkbox"/> Other _____ <b>Water Surface Oils</b> <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____ <b>Turbidity (if not measured)</b> <input type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Turbid <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
<b>SEDIMENT/SUBSTRATE</b>	<b>Odors</b> <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Chemical <input type="checkbox"/> Other _____ <input type="checkbox"/> Sewage <input type="checkbox"/> Anaerobic <input type="checkbox"/> Petroleum <input type="checkbox"/> None	<b>Deposits</b> <input type="checkbox"/> Sludge <input type="checkbox"/> Relict shells <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand <input type="checkbox"/> Other <i>NONE</i> Looking at stones which are not deeply embedded, are the undersides black in color? <input type="checkbox"/> Yes <input type="checkbox"/> No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	10%
Boulder	> 256 mm (10")	0	Muck-Mud	black, very fine organic (FPOM)	90%
Cobble	64-256 mm (2.5"-10")	0			
Gravel	2-64 mm (0.1"-2.5")	0	Silt		0
Sand	0.06-2mm (gritty)	0			
Silt	0.004-0.06 mm	100%			
Clay	<0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <i>Phillips Pond</i>	LOCATION <i>IPSD - PPO3</i>
STATION # <i>IP3004</i> RIVERMILE _____	STREAM CLASS _____
LAT _____ LONG _____	RIVER BASIN _____
STORET # _____	AGENCY _____
INVESTIGATORS <i>Roberts, O'Neill</i>	
FORM COMPLETED BY <i>Roberts</i>	DATE <i>6/25/01</i> TIME <i>10:10</i> (AM) PM
REASON FOR SURVEY <i>Triad Sampling</i>	

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
<b>1. Epifaunal Substrate/ Available Cover</b>  <i>11</i>  SCORE	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>2. Pool Substrate Characterization</b>  <i>8</i>  SCORE	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>3. Pool Variability</b>  <i>N/A</i>  SCORE	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>4. Sediment Deposition</b>  <i>2</i>  SCORE	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material; increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>5. Channel Flow Status</b>  <i>20</i>  SCORE	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Parameters to be evaluated in sampling reach

*pond*

*Some range of investigator scores & if final score is 20*

2903

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration  15  SCORE	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity  N/A  SCORE	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)  SCORE 6 (LB) SCORE 8 (RB)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars
	Left Bank 10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0
	Right Bank 10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0
9. Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream.  SCORE 9 (LB) SCORE 9 (RB)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent, more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	Left Bank 10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0
	Right Bank 10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)  SCORE 3 (LB) SCORE 4 (RB)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
	Left Bank 10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0
	Right Bank 10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0	10 9 8 7 6 5 4 3 2 1 0

Pond created 25 yrs

Ponded Islands present stream in 1st 1/2 mile thru

Total Score 102

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(FRONT)**

STREAM NAME <u>S. Bl. Abernethy R</u>	LOCATION <u>TPSD - TTSA01</u>	
STATION <u>TTSA01</u> RIVERMILE _____	STREAM CLASS _____	
LAT _____ LONG _____	RIVER BASIN _____	
STORET # _____	AGENCY _____	
INVESTIGATORS <u>Roberts, O'Neill, Munnett, Ross, deMay</u>	REASON FOR SURVEY _____	
FORM COMPLETED BY <u>Roberts</u>	DATE <u>6/25/01</u> TIME <u>2pm</u> AM ( ) PM ( <input checked="" type="checkbox"/> )	REASON FOR SURVEY <u>Triad Sampling</u>

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <u>Showers yesterday</u>
	<input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input checked="" type="checkbox"/> 10% cloud cover <input type="checkbox"/> clear/sunny	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> % <input type="checkbox"/>	Air Temperature <u>80-85 °F</u> Other _____

SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph)  
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STREAM CHARACTERIZATION	Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal	Stream Type <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater
	Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed <input type="checkbox"/> Non-glacial montane <input type="checkbox"/> Mixture of origins <input type="checkbox"/> Swamp and bog <input checked="" type="checkbox"/> Other _____	Catchment Area _____ km <sup>2</sup>

TTSA01

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(BACK)

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Other _____ <input checked="" type="checkbox"/> Residential	<b>Local Watershed NPS Pollution</b> <input checked="" type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources <i>Road run-off?</i>
		<b>Local Watershed Erosion</b> <input checked="" type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy
<b>RIPARIAN VEGETATION (18 meter buffer)</b>	<b>Indicate the dominant type and record the dominant species present</b> <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous dominant species present <i>Red maple, No. rainwood, cattails (bordered)</i>	
<b>INSTREAM FEATURES</b>	Estimated Reach Length _____ m Estimated Stream Width <i>5 ft</i> m Sampling Reach Area <i>5 ft<sup>2</sup></i> m <sup>2</sup> Area in km <sup>2</sup> (m <sup>2</sup> x 1000) _____ km <sup>2</sup> Estimated Stream Depth <i>0.7 ft</i> Surface Velocity (at thalweg) <i>0 to very low flow</i> m/sec	Canopy Cover <input type="checkbox"/> Partly open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded <i>open</i> High Water Mark _____ m <b>Proportion of Reach Represented by Stream Morphology Types</b> <input type="checkbox"/> Riffle _____ % <input type="checkbox"/> Run _____ % <input checked="" type="checkbox"/> Pool <i>100</i> % Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>LARGE WOODY DEBRIS</b>	LWD _____ m <sup>3</sup> <i>2590</i> Density of LWD _____ m <sup>3</sup> /km <sup>2</sup> (LWD/ reach area)	<i>few small branches, chunks wood</i>
<b>AQUATIC VEGETATION</b>	<b>Indicate the dominant type and record the dominant species present</b> <input type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating <input type="checkbox"/> Floating Algae <input type="checkbox"/> Attached Algae dominant species present <i>None in sample area</i> Portion of the reach with aquatic vegetation <i>0</i> %	
<b>WATER QUALITY</b>	Temperature <i>25.00</i> °C Specific Conductance <i>277.00</i> Dissolved Oxygen <i>5.73</i> pH <i>6.91</i> Turbidity <i>24.8 NTU</i> <i>11.7 NTU</i> WQ Instrument Used <i>YSI ORP-58.2.2.2V</i>	<b>Water Odors</b> <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____ <b>Water Surface Oils</b> <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____ <b>Turbidity (if not measured)</b> <input type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
<b>SEDIMENT/SUBSTRATE</b>	<b>Odors</b> <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Other _____ <b>Oils</b> <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse	<b>Deposits</b> <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand <input type="checkbox"/> Relict shells <input checked="" type="checkbox"/> Other <i>None</i> <b>Looking at stones which are not deeply embedded, are the undersides black in color?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>N/A</i>

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	50
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	50
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	30	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	70			
Clay	< 0.004 mm (slick)	0			

## HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>So. B. Abeyona Riv</u>	LOCATION <u>TPSD - TISA01</u>
STATION # <u>TISA01</u> RIVERMILE _____	STREAM CLASS _____
LAT _____ LONG _____	RIVER BASIN _____
STORET # _____	AGENCY _____
INVESTIGATORS <u>Roberts, O'Neill, Munney</u>	
FORM COMPLETED BY <u>Roberts</u>	DATE <u>6/25</u> TIME <u>2pm</u> AM (PM) REASON FOR SURVEY <u>Triad Sampling</u>

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	<b>1. Epifaunal Substrate/ Available Cover</b>  <div style="text-align: center; font-size: 2em; font-weight: bold;">13</div>	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed) <u>no</u>	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	<del>20</del> <del>19</del> <del>18</del> <del>17</del> <del>16</del>	<del>15</del> <del>14</del> <del>13</del> <del>12</del> <del>11</del>	<del>10</del> <del>9</del> <del>8</del> <del>7</del> <del>6</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>
	<b>2. Pool Substrate Characterization</b>  <div style="text-align: center; font-size: 2em; font-weight: bold;">10</div>	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	<del>20</del> <del>19</del> <del>18</del> <del>17</del> <del>16</del>	<del>15</del> <del>14</del> <del>13</del> <del>12</del> <del>11</del>	<del>10</del> <del>9</del> <del>8</del> <del>7</del> <del>6</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>
	<b>3. Pool Variability</b>  <div style="text-align: center; font-size: 2em; font-weight: bold;">5</div>	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	<del>20</del> <del>19</del> <del>18</del> <del>17</del> <del>16</del>	<del>15</del> <del>14</del> <del>13</del> <del>12</del> <del>11</del>	<del>10</del> <del>9</del> <del>8</del> <del>7</del> <del>6</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>
<b>4. Sediment Deposition</b>  <div style="text-align: center; font-size: 2em; font-weight: bold;">5</div>	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material; increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
SCORE	<del>20</del> <del>19</del> <del>18</del> <del>17</del> <del>16</del>	<del>15</del> <del>14</del> <del>13</del> <del>12</del> <del>11</del>	<del>10</del> <del>9</del> <del>8</del> <del>7</del> <del>6</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>	
<b>5. Channel Flow Status</b>  <div style="text-align: center; font-size: 2em; font-weight: bold;">19</div>	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools	
SCORE	<del>20</del> <del>19</del> <del>18</del> <del>17</del> <del>16</del>	<del>15</del> <del>14</del> <del>13</del> <del>12</del> <del>11</del>	<del>10</del> <del>9</del> <del>8</del> <del>7</del> <del>6</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>	

TTSA01

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
<b>6. Channel Alteration</b>  <div style="font-size: 2em; font-weight: bold; text-align: center;">19</div>	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	<del>20</del> 19 <del>18</del> <del>17</del> <del>16</del>	<del>15</del> <del>14</del> <del>13</del> <del>12</del> <del>11</del>	<del>10</del> <del>9</del> <del>8</del> <del>7</del> <del>6</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>
<b>7. Channel Sinuosity</b>  <div style="font-size: 2em; font-weight: bold; text-align: center;">14 N/A</div>	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	<del>20</del> <del>19</del> <del>18</del> <del>17</del> <del>16</del>	<del>15</del> <del>14</del> <del>13</del> <del>12</del> <del>11</del>	<del>10</del> <del>9</del> <del>8</del> <del>7</del> <del>6</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>
<b>8. Bank Stability (score each bank)</b>  SCORE <u>10</u> (LB) SCORE <u>10</u> (RB)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
Left Bank	<del>10</del> 9 <del>8</del> <del>7</del> <del>6</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>	<del>2</del> <del>1</del> <del>0</del>
Right Bank	<del>10</del> 9 <del>8</del> <del>7</del> <del>6</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>	<del>2</del> <del>1</del> <del>0</del>
<b>9. Vegetative Protection (score each bank)</b>  Note: determine left or right side by facing downstream.  SCORE <u>10</u> (LB) SCORE <u>10</u> (RB)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common, less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
Left Bank	<del>10</del> 9 <del>8</del> <del>7</del> <del>6</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>	<del>2</del> <del>1</del> <del>0</del>
Right Bank	<del>10</del> 9 <del>8</del> <del>7</del> <del>6</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>	<del>2</del> <del>1</del> <del>0</del>
<b>10. Riparian Vegetative Zone Width (score each bank riparian zone)</b>  SCORE <u>5</u> (LB) SCORE <u>10</u> (RB)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
Left Bank	<del>10</del> 9 <del>8</del> <del>7</del> <del>6</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>	<del>5</del> 4 3 <del>2</del> <del>1</del> <del>0</del>	<del>2</del> <del>1</del> <del>0</del>
Right Bank	<del>10</del> 9 <del>8</del> <del>7</del> <del>6</del>	<del>5</del> <del>4</del> <del>3</del> <del>2</del> <del>1</del> <del>0</del>	<del>5</del> 4 3 <del>2</del> <del>1</del> <del>0</del>	<del>2</del> <del>1</del> <del>0</del>

Parameters to be evaluated broader than sampling reach

already channelized

Zone 6-8m wide  
No visible impacts other than road

Total Score 126

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(FRONT)**

STREAM NAME <i>S. B. Abernethy</i>	LOCATION <i>IPSD - TTSD 01</i>	
STATION # <i>TTSD 01</i> RIVERMILE _____	STREAM CLASS _____	
LAT _____ LONG _____	RIVER BASIN _____	
STORET # _____	AGENCY _____	
INVESTIGATORS <i>Roberts, O'Neill, Rosin, deMay</i>	DATE <i>6/25/01</i>	
FORM COMPLETED BY <i>Roberts</i>	TIME <i>4:00</i> AM PM	REASON FOR SURVEY <i>Triad Sampling</i>

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? <input type="checkbox"/> Yes <input type="checkbox"/> No
	<input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input checked="" type="checkbox"/> 5% showers (intermittent) <input type="checkbox"/> %cloud cover <input type="checkbox"/> clear/sunny	<input type="checkbox"/> <input checked="" type="checkbox"/> 100% <input type="checkbox"/>	Air Temperature _____ °C Other _____

SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph)

STREAM CHARACTERIZATION	Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal	Stream Type <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater
	Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed <input type="checkbox"/> Non-glacial montane <input type="checkbox"/> Mixture of origins <input type="checkbox"/> Swamp and bog <input checked="" type="checkbox"/> Other <i>other</i>	Catchment Area _____ km <sup>2</sup>

TTSD01

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Other _____ <input checked="" type="checkbox"/> Residential	<b>Local Watershed NPS Pollution</b> <input checked="" type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources  <b>Local Watershed Erosion</b> <input checked="" type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy
<b>RIPARIAN VEGETATION (18 meter buffer)</b>	Indicate the dominant type and record the dominant species present <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous dominant species present <u>Red maple, dogwood, sweetweed, sensitive fern</u>	
<b>INSTREAM FEATURES</b>	Estimated Reach Length _____ m Estimated Stream Width <u>15 ft</u> Sampling Reach Area <u>356 m<sup>2</sup></u> Area in km <sup>2</sup> (m <sup>2</sup> x 1000) _____ km <sup>2</sup> Estimated Stream Depth <u>3.4"</u> Surface Velocity <u>low flow</u> (at thalweg) <u>adjacent channel</u>	Canopy Cover <input type="checkbox"/> Partly open <input checked="" type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded High Water Mark _____ m Proportion of Reach Represented by Stream Morphology Types <input type="checkbox"/> Riffle _____% <input checked="" type="checkbox"/> Run _____% <input type="checkbox"/> Pool _____% Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>LARGE WOOLY DEBRIS</b>	LWD <u>10%</u> Density of LWD _____ m <sup>2</sup> /km <sup>2</sup> (LWD/reach area)	
<b>AQUATIC VEGETATION</b>	Indicate the dominant type and record the dominant species present <input checked="" type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating <input type="checkbox"/> Floating Algae <input type="checkbox"/> Attached Algae dominant species present <u>Ludwigia palustris</u> Portion of the reach with aquatic vegetation _____%	
<b>WATER QUALITY</b>	Temperature <u>24.7°C</u> Specific Conductance <u>177.00</u> Dissolved Oxygen <u>4.47 ppm</u> pH <u>6.93</u> Turbidity <u>7.5 NTU</u> WQ Instrument Used <u>YSI</u> <u>ORP -64.4</u>	<b>Water Odors</b> <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____  <b>Water Surface Oils</b> <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____  <b>Turbidity (if not measured)</b> <input type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
<b>SEDIMENT/SUBSTRATE</b>	<b>Odors</b> <input type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input checked="" type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Other _____ <b>Oils</b> <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse <u>Some sulfide odor</u>	<b>Deposits</b> <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand <input type="checkbox"/> Relict shells <input checked="" type="checkbox"/> Other <u>NONE</u>  Looking at stones which are not deeply embedded, are the undersides black in color? <input type="checkbox"/> Yes <input type="checkbox"/> No <u>N/A</u>

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	50
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	50
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	10	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	90			
Clay	< 0.004 mm (slick)	0			

**HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)**

STREAM NAME <i>So. Bl. Abasco</i>	LOCATION <i>TPSD-TT 5001</i>
STATION # _____ RIVERMILE _____	STREAM CLASS _____
LAT _____ LONG _____	RIVER BASIN _____
STORET # _____	AGENCY _____
INVESTIGATORS <i>Roberts, Rosina, O'Neill (LeMay)</i>	
FORM COMPLETED BY <i>Roberts</i>	DATE <i>6/25/01</i> TIME <i>4:15</i> AM <input checked="" type="radio"/> PM <input type="radio"/>
	REASON FOR SURVEY <i>Final Sampling</i>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover  <i>16</i>	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	<del>20</del> <del>19</del> <del>18</del> <del>17</del> <b>16</b>	<del>15</del> <del>14</del> <del>13</del> <del>12</del> <del>11</del>	<del>10</del> <del>9</del> <del>8</del> <del>7</del> <del>6</del>
2. Pool Substrate Characterization  <i>11</i>	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	<del>20</del> <del>19</del> <del>18</del> <del>17</del> <del>16</del>	<del>15</del> <del>14</del> <del>13</del> <del>12</del> <b>11</b>	<del>10</del> <del>9</del> <del>8</del> <del>7</del> <del>6</del>
3. Pool Variability  <i>8</i>	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	<del>20</del> <del>19</del> <del>18</del> <del>17</del> <del>16</del>	<del>15</del> <del>14</del> <del>13</del> <del>12</del> <del>11</del>	<del>10</del> <del>9</del> <b>8</b> <del>7</del> <del>6</del>
4. Sediment Deposition  <i>10</i>	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	<del>20</del> <del>19</del> <del>18</del> <del>17</del> <del>16</del>	<del>15</del> <del>14</del> <del>13</del> <del>12</del> <del>11</del>	<b>10</b> <del>9</del> <del>8</del> <del>7</del> <del>6</del>
5. Channel Flow Status  <i>16</i>	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	<del>20</del> <del>19</del> <del>18</del> <del>17</del> <b>16</b>	<del>15</del> <del>14</del> <del>13</del> <del>12</del> <del>11</del>	<del>10</del> <del>9</del> <del>8</del> <del>7</del> <del>6</del>

TTSD01

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
<b>6. Channel Alteration</b>  18	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6
<b>7. Channel Sinuosity</b>  10	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6
<b>8. Bank Stability (score each bank)</b>  SCORE 9 (LB) SCORE 9 (RB)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	Left Bank	10 9	5 4 3 2 1 0	5 4 3 2 1 0
	Right Bank	10 9	5 4 3 2 1 0	5 4 3 2 1 0
<b>9. Vegetative Protection (score each bank)</b>  Note: determine left or right side by facing downstream.  SCORE 9 (LB) SCORE 9 (RB)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	Left Bank	10 9	5 4 3 2 1 0	2 1 0
	Right Bank	10 9	5 4 3 2 1 0	2 1 0
<b>10. Riparian Vegetative Zone Width (score each bank riparian zone)</b>  SCORE 9 (LB) SCORE 9 (RB)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
	Left Bank	10 9	8 7 6 5 4 3	2 1 0
	Right Bank	10 9	8 7 6 5 4 3	2 1 0

Total Score 143

TTA003

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(FRONT)

STREAM NAME <u>Abbeys R / Upper</u>		LOCATION <u>TPSD-TTA003</u>
STATION # <u>TTA003</u> RIVERMILE _____		STREAM CLASS _____
LAT _____	LONG _____	RIVER BASIN _____
STORET # _____		AGENCY _____
INVESTIGATORS <u>Roberts, Rosini, O'Neill</u>		
FORM COMPLETED BY <u>Roberts</u>		DATE <u>6/27/01</u> TIME <u>11:30</u> <u>AM</u> <u>PM</u>
REASON FOR SURVEY <u>Triad sampling</u>		

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? <input type="checkbox"/> Yes <input type="checkbox"/> No
	<input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input type="checkbox"/> %cloud cover _____ <input checked="" type="checkbox"/> clear/sunny	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> % _____	<u>Shower 6/27</u> Air Temperature <u>75°F</u> Other _____

SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph)  <p style="text-align: center;"><u>See map for UFO2</u></p>
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STREAM CHARACTERIZATION	Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal	Stream Type <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater
	Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed <input type="checkbox"/> Non-glacial montane <input type="checkbox"/> Mixture of origins <input type="checkbox"/> Swamp and bog <input checked="" type="checkbox"/> Other <u>UFR</u>	Catchment Area _____ km <sup>2</sup>

TTA003

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(BACK)

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> <input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Other _____ <input checked="" type="checkbox"/> Residential	<b>Local Watershed NPS Pollution</b> <input type="checkbox"/> No evidence <input checked="" type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources <i>Residential Leaks</i>
		<b>Local Watershed Erosion</b> <input type="checkbox"/> None <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Heavy <i>possible - slight</i>
<b>RIPARIAN VEGETATION (18 meter buffer)</b>	Indicate the dominant type and record the dominant species present <input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbaceous dominant species present <u>Oaks, Dogwood</u>	
<b>INSTREAM FEATURES</b>	Estimated Reach Length _____ m Estimated Stream Width _____ m Sampling Reach Area <u>120</u> m <sup>2</sup> Area in km <sup>2</sup> (m <sup>2</sup> x 1000) _____ km <sup>2</sup> Estimated Stream Depth <u>5'</u> m Surface Velocity <u>0</u> m/sec <i>Low flow</i>	<b>Canopy Cover</b> <input type="checkbox"/> Partly open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded <u>open</u> <b>High Water Mark</b> _____ m <i>level just below high mark (2')</i> <b>Proportion of Reach Represented by Stream Morphology Types</b> <input type="checkbox"/> Riffle _____ % <input type="checkbox"/> Run _____ % <input checked="" type="checkbox"/> Pool <u>100</u> % Channelized <input type="checkbox"/> Yes <input type="checkbox"/> No Dam Present <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>LARGE WOODY DEBRIS</b>	LWD _____ m <sup>2</sup> Density of LWD _____ m <sup>2</sup> /km <sup>2</sup> (LWD/ reach area) <u>NO</u>	
<b>AQUATIC VEGETATION</b>	Indicate the dominant type and record the dominant species present <input type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating <input type="checkbox"/> Floating Algae <input type="checkbox"/> Attached Algae dominant species present <u>NONE</u> Portion of the reach with aquatic vegetation _____ % <u>NONE</u>	
<b>WATER QUALITY</b>	Temperature <u>24.65</u> °C Specific Conductance <u>477.00</u> µS/cm Dissolved Oxygen <u>7.18</u> ppm pH <u>7.54</u> Turbidity <u>6.4</u> NTU WQ Instrument Used <u>YSI ORP - 99.1</u>	<b>Water Odors</b> <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____ <b>Water Surface Oils</b> <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____ <b>Turbidity (if not measured)</b> <input type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
<b>SEDIMENT/SUBSTRATE</b>	<b>Odors</b> <input type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input checked="" type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Other _____ <b>Oils</b> <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse	<b>Deposits</b> <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand <input type="checkbox"/> Relict shells <input type="checkbox"/> Other <u>NONE</u> <b>Looking at stones which are not deeply embedded, are the undersides black in color?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <u>N/A</u>

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	25%
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	95%
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	0	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	100%			
Clay	< 0.004 mm (slick)	0			

some leaf matter

**HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)**

*American Outlet*

STREAM NAME <i>Upper Mystic Lake</i>	LOCATION <i>IPSD-TTAD03</i>
STATION # <i>TTAD03</i> RIVERMILE _____	STREAM CLASS _____
LAT _____ LONG _____	RIVER BASIN _____
STORET # _____	AGENCY _____
INVESTIGATORS <i>Roberts, Rosalyn O'Neil</i>	
FORM COMPLETED BY <i>Roberts</i>	DATE <i>6/29/01</i> TIME <i>11:30</i> (AM) (PM) REASON FOR SURVEY <i>Triad Sampling</i>

*See UFOC*

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover  <i>11</i>	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	<del>20</del> 19 18 17 16	<del>15</del> 14 13 12 11	<del>10</del> 9 8 7 6
2. Pool Substrate Characterization  <i>8</i>	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat, no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	<del>20</del> 19 18 17 16	<del>15</del> 14 13 12 11	<del>10</del> 9 8 7 6
3. Pool Variability  <i>N/A</i>	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	<del>20</del> 19 18 17 16	<del>15</del> 14 13 12 11	<del>10</del> 9 8 7 6
4. Sediment Deposition  <i>3</i>	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	<del>20</del> 19 18 17 16	<del>15</del> 14 13 12 11	<del>10</del> 9 8 7 6
5. Channel Flow Status  <i>16</i>	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	<del>20</del> 19 18 17 16	<del>15</del> 14 13 12 11	<del>10</del> 9 8 7 6

TTA003

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
<p>6. Channel Alteration</p> <p>12</p>	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<p>7. Channel Sinuosity</p> <p>2</p>	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<p>8. Bank Stability (score each bank)</p> <p>SCORE 4 (LB)</p> <p>SCORE 2 (RB)</p>	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9 8 7 6	5 4 3 2 1 0	5 4 3 2 1 0	5 4 3 2 1 0
SCORE (RB)	Right Bank 10 9 8 7 6	5 4 3 2 1 0	5 4 3 2 1 0	5 4 3 2 1 0
<p>9. Vegetative Protection (score each bank)</p> <p>Note: determine left or right side by facing downstream.</p> <p>SCORE 6 (LB)</p> <p>SCORE 4 (RB)</p>	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9 8 7 6	5 4 3 2 1 0	5 4 3 2 1 0	5 4 3 2 1 0
SCORE (RB)	Right Bank 10 9 8 7 6	5 4 3 2 1 0	5 4 3 2 1 0	5 4 3 2 1 0
<p>10. Riparian Vegetative Zone Width (score each bank riparian zone)</p> <p>SCORE 5 (LB)</p> <p>SCORE 2 (RB)</p>	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9 8 7 6	5 4 3 2 1 0	5 4 3 2 1 0	5 4 3 2 1 0
SCORE (RB)	Right Bank 10 9 8 7 6	5 4 3 2 1 0	5 4 3 2 1 0	5 4 3 2 1 0

Total Score 93

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(FRONT)**

STREAM NAME <u>Hall's Brook</u>	LOCATION <u>IPSD-TT04</u>	
STATION # <u>50704</u> RIVERMILE	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS <u>Roberts, O'Mail, Ho SKINS</u>		
FORM COMPLETED BY <u>Roberts</u>	DATE <u>6/26</u> TIME <u>9:30</u> <input checked="" type="radio"/> AM <input type="radio"/> PM	REASON FOR SURVEY <u>Triad Sampling</u>

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <u>shower 6/24</u>
	<input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input type="checkbox"/> %cloud cover _____ <input checked="" type="checkbox"/> clear/sunny	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> 10% <input type="checkbox"/>	Air Temperature <u>80°F</u> Other _____

SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph)
	<p>A hand-drawn map of a stream section. The stream flows from left to right, indicated by arrows. On the left bank, there are labels 'PFM' and 'Thapa PFM'. The stream bed is labeled 'Reed Carex grass'. On the right bank, there is a circled area labeled 'Alder' and 'Stake'. A point on the stream is marked with an 'X' and labeled 'Sampled within 12' of Stake'. Other labels include 'Alder', 'Carex', 'PFO', and 'PFO' scattered around the stream. A north arrow points upwards.</p>

STREAM CHARACTERIZATION	Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal	Stream Type <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater
	Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Non-glacial montane <input type="checkbox"/> Swamp and bog	Catchment Area _____ km <sup>2</sup>

TTO4

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(BACK)

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Other _____ <input checked="" type="checkbox"/> Residential	<b>Local Watershed NPS Pollution</b> <input checked="" type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources  <b>Local Watershed Erosion</b> <input checked="" type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy
<b>RIPARIAN VEGETATION (18 meter buffer)</b>	Indicate the dominant type and record the dominant species present <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input checked="" type="checkbox"/> Grasses <input type="checkbox"/> Herbaceous dominant species present <u>Red maple, speckled Alder, Reed canary grass.</u>	
<b>INSTREAM FEATURES</b>	Estimated Reach Length _____ m Estimated Stream Width <u>5 ft</u> Sampling Reach Area <u>12 ft<sup>2</sup></u> Area in km <sup>2</sup> (m <sup>2</sup> x 1000) _____ km <sup>2</sup> Estimated Stream Depth <u>0.3-0.5 ft</u> Surface Velocity _____ m/sec (at thalweg) <u>Noticeable, slow flow</u>	
	Canopy Cover <input type="checkbox"/> Partly open <input checked="" type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded  High Water Mark _____ m Proportion of Reach Represented by Stream Morphology Types <input checked="" type="checkbox"/> Riffle <u>100%</u> <input type="checkbox"/> Run _____ % <input type="checkbox"/> Pool _____ %  Channelized <input type="checkbox"/> Yes <input type="checkbox"/> No Dam Present <input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>LARGE WOODY DEBRIS</b>	LWD _____ m <sup>2</sup> <u>&lt; 590 sticks, pieces</u> Density of LWD _____ m <sup>2</sup> /km <sup>2</sup> (LWD/ reach area)	
<b>AQUATIC VEGETATION</b>	Indicate the dominant type and record the dominant species present <input checked="" type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating <input type="checkbox"/> Floating Algae <input type="checkbox"/> Attached Algae dominant species present <u>reed canary grass</u> Portion of the reach with aquatic vegetation _____ %	
<b>WATER QUALITY</b>	Temperature <u>20.6°C</u> Specific Conductance <u>405.00 µS/cm</u> Dissolved Oxygen <u>5.90 ppm</u> pH <u>7.46</u> Turbidity <u>6.1 MTU</u> WQ Instrument Used <u>YSI</u> <u>ORP -55.4</u>	
	Water Odors <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____  Water Surface Oils <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____  Turbidity (if not measured) <input type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____	
<b>SEDIMENT/ SUBSTRATE</b>	Odors <input type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input checked="" type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Other <u>1 dredge anaerobic</u> <u>others odorless</u>  Oils <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse  Deposits <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand <input type="checkbox"/> Relict shells <input type="checkbox"/> Other <u>none</u>  Looking at stones which are not deeply embedded, are the undersides black in color? <input type="checkbox"/> Yes <input type="checkbox"/> No <u>N/A</u>	

pond at station 1000/525

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	15
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0			
Gravel	2-64 mm (0.1"-2.5")	0	Muck-Mud	black, very fine organic (FPOM)	85
Sand	0.06-2mm (grnty)	20%	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	80%			
Clay	< 0.004 mm (stick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Hull's Brook</u>	LOCATION <u>IPSD-TT04</u>
STATION # <u>S01104</u> RIVERMILE _____	STREAM CLASS _____
LAT _____ LONG _____	RIVER BASIN _____
STORET # _____	AGENCY _____
INVESTIGATORS <u>Roberts, Hostings, O'Neill</u>	
FORM COMPLETED BY <u>Roberts</u>	DATE <u>6/26</u> TIME <u>9:30</u> <input checked="" type="radio"/> AM <input type="radio"/> PM
	REASON FOR SURVEY <u>Triod Sampling</u>

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
<b>1. Epifaunal Substrate/ Available Cover</b>  SCORE <u>13</u>	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>2. Pool Substrate Characterization</b>  SCORE <u>14</u>	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>3. Pool Variability</b>  SCORE <u>6</u>	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>4. Sediment Deposition</b>  SCORE <u>8</u>	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>5. Channel Flow Status</b>  SCORE <u>19</u>	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Parameters to be evaluated in sampling reach

Recent rains, high water level high precip in June

T104

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration  19  SCORE	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity  10  SCORE	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line. 2 to 3	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight, waterway has been channelized for a long distance.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank)  SCORE 10 (LB) SCORE 10 (RB)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	Left Bank 10 9 8 7 6	5 4 3 2 1 0	Right Bank 10 9 8 7 6	5 4 3 2 1 0
9. Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream.  SCORE 10 (LB) SCORE 10 (RB)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	Left Bank 10 9 8 7 6	5 4 3 2 1 0	Right Bank 10 9 8 7 6	5 4 3 2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)  SCORE 10 (LB) SCORE 10 (RB)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
	Left Bank 10 9 8 7 6	5 4 3 2 1 0	Right Bank 10 9 8 7 6	5 4 3 2 1 0

Total Score 149

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(FRONT)**

STREAM NAME <u>Upper Mystic Lake</u>	LOCATION <u>Upper Forebay IPSD-TTUUF02</u>	
STATION # <u>TTUUF02</u> RIVER MILE _____	STREAM CLASS _____	
LAT _____ LONG _____	RIVER BASIN _____	
STORET # _____	AGENCY _____	
INVESTIGATORS <u>Roberts, McNeill, Rosier</u>		
FORM COMPLETED BY <u>Roberts</u>	DATE <u>6/27/01</u> TIME <u>9:30</u> <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	REASON FOR SURVEY <u>Triad Survey</u>

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? <input type="checkbox"/> Yes <input type="checkbox"/> No <u>showers 6/24</u>
	<input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input checked="" type="checkbox"/> %cloud cover clear/sunny	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> %	Air Temperature <u>75°F</u> Other <u>light breeze</u>

SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph)

STREAM CHARACTERIZATION	Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal	Stream Type <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater
	Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed <input type="checkbox"/> Non-glacial montane <input type="checkbox"/> Mixture of origins <input type="checkbox"/> Swamp and bog <input type="checkbox"/> Other <u>Urban</u>	Catchment Area _____ km <sup>2</sup>

TTUFO2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> <input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Other _____ <input checked="" type="checkbox"/> Residential	<b>Local Watershed NPS Pollution</b> <input type="checkbox"/> No evidence <input checked="" type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources <i>lawns, driveway, roadways</i> <b>Local Watershed Erosion</b> <input checked="" type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy
<b>RIPARIAN VEGETATION (18 meter buffer)</b> <i>east shore</i>	Indicate the dominant type and record the dominant species present <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input checked="" type="checkbox"/> Grasses <input type="checkbox"/> Herbaceous dominant species present <i>Silver maple, buck thorn, maid grass</i>	
<b>INSTREAM FEATURES</b> <i>9000s</i>	Estimated Reach Length _____ m Estimated Stream Width _____ m Sampling Reach Area <i>10 ft<sup>2</sup></i> Area in km <sup>2</sup> (m <sup>2</sup> x1000) _____ km <sup>2</sup> Estimated Stream Depth <i>7.15 m</i> Surface Velocity _____ m/sec (at thalweg) <i>No flow</i>	Canopy Cover <input type="checkbox"/> Partly open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded <i>open</i> High Water Mark _____ m <i>water just below high mark</i> Proportion of Reach Represented by Stream Morphology Types <input type="checkbox"/> Riffle _____ % <input type="checkbox"/> Run _____ % <input checked="" type="checkbox"/> Pool <i>100</i> % Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Dam Present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>downstream</i>
<b>LARGE WOODY DEBRIS</b>	LWD _____ m <sup>2</sup> <i>NONE</i> Density of LWD _____ m <sup>2</sup> /km <sup>2</sup> (LWD/ reach area)	
<b>AQUATIC VEGETATION</b>	Indicate the dominant type and record the dominant species present <input type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating <input type="checkbox"/> Floating Algae <input type="checkbox"/> Attached Algae dominant species present <i>None in sample area</i> Portion of the reach with aquatic vegetation _____ % <i>Lilies N 2m away</i>	
<b>WATER QUALITY</b> <i>@ 6'</i>	Temperature <i>22.9</i> °C Specific Conductance <i>369.00</i> µS/cm Dissolved Oxygen <i>2.57</i> ppm pH <i>7.34</i> Turbidity <i>6.7</i> NTU WQ Instrument Used <i>YSI</i> <i>ORP = 90.6</i>	<b>Water Odors</b> <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____ <b>Water Surface Oils</b> <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globbs <input type="checkbox"/> Flecks <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____ <b>Turbidity (if not measured)</b> <input type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
<b>SEDIMENT/SUBSTRATE</b>	<b>Odors</b> <input type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input checked="" type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Other _____ <b>Oils</b> <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse	<b>Deposits</b> <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand <input type="checkbox"/> Relict shells <input type="checkbox"/> Other <i>ALGAE</i> <b>Looking at stones which are not deeply embedded, are the undersides black in color?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <i>N/A</i>

west shore  
to east/law

→  
→  
→  
→

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	25%
Boulder	> 256 mm (10")	0	Muck-Mud	black, very fine organic (FPOM)	95%
Cobble	64-256 mm (2.5"-10")	0	Marl	grey, shell fragments	—
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	0			
Silt	0.004-0.06 mm	100%			
Clay	< 0.004 mm (slick)	6			

Substrate, Colmocant

## HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Upper Mystic Lake</u>	LOCATION <u>Upper Gateway IPSD-TTUFO2</u>	
STATION # <u>TTUFO2</u> RIVERMILE	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS <u>Roberts, O'Neill, Rosier</u>		
FORM COMPLETED BY <u>Roberts</u>	DATE <u>6/27/01</u> TIME <u>9:30</u> <u>AM</u> PM	REASON FOR SURVEY <u>Triad Sampling</u>

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	<b>1. Epifaunal Substrate/ Available Cover</b>  <div style="text-align: center; font-size: 2em;">11</div>	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed ← <u>NO</u>	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	<b>2. Pool Substrate Characterization</b>  <div style="text-align: center; font-size: 2em;">8</div>	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 (8) 7 6	5 4 3 2 1 0
	<b>3. Pool Variability</b>  <div style="text-align: center; font-size: 2em;">N/A</div>	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>4. Sediment Deposition</b>  <div style="text-align: center; font-size: 2em;">3</div>	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 (3) 2 1 0	
<b>5. Channel Flow Status</b>  <div style="text-align: center; font-size: 2em;">18</div>	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	

All mud

pools

TTUF02

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration  12	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6
7. Channel Sinuosity  2	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6
8. Bank Stability (score each bank)  SCORE 8 (LB) SCORE 8 (RB)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	SCORE (LB)	10 9	8 7 6	5 4 3 2 1 0
	SCORE (RB)	10 9	8 7 6	5 4 3 2 1 0
9. Vegetative Protection (score each bank)  Note: determine left or right side by facing downstream.  SCORE 8 (LB) SCORE 7 (RB)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE (LB)	10 9	8 7 6	5 4 3 2 1 0
	SCORE (RB)	10 9	8 7 6	5 4 3 2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)  SCORE 5 (LB) SCORE 5 (RB)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
	SCORE (LB)	10 9	8 7 6	(5) 4 3 2 1 0
	SCORE (RB)	10 9	8 7 6	(5) 4 3 2 1 0

Sea wall on shore down stream

Parameters to be evaluated broader than sampling reach

Total Score 95

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(FRONT)**

STREAM NAME <u>Judkins Pond</u>	LOCATION <u>IPSD-110603</u>	
STATION # <u>110603</u> RIVERMILE _____	STREAM CLASS _____	
LAT _____ LONG _____	RIVER BASIN _____	
STORET # _____	AGENCY _____	
INVESTIGATORS <u>Roberts, HasKINS, O'Neill</u>		
FORM COMPLETED BY <u>Roberts</u>	DATE <u>6/26/01</u> TIME <u>3pm</u> AM PM	REASON FOR SURVEY <u>Triad Sampling</u>

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? <input type="checkbox"/> Yes <input type="checkbox"/> No
	<input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input checked="" type="checkbox"/> %cloud cover _____ <input checked="" type="checkbox"/> clear/sunny	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____	<u>Showered 9/6/24</u> Air Temperature <u>98°C</u> Other _____

SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph)
	<p>Sampled around odors 1.74 pads</p> <p>Train Track</p> <p>Parking lot</p> <p>Judkins Pond</p> <p>Shrub</p> <p>20' 30"</p> <p>Building</p>

STREAM CHARACTERIZATION	Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal	Stream Type <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater
	Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed <input type="checkbox"/> Non-glacial montane <input checked="" type="checkbox"/> Mixture of origins <input type="checkbox"/> Swamp and bog <input checked="" type="checkbox"/> Other <u>_____</u>	Catchment Area _____ km <sup>2</sup>

TT0603

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> <input type="checkbox"/> Forest <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Other <u>Roads</u>	<b>Local Watershed NPS Pollution</b> <input type="checkbox"/> No evidence <input checked="" type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources <u>Road/Stormwater</u> <b>Local Watershed Erosion</b> <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy
<b>RIPARIAN VEGETATION (18 meter buffer)</b>	<b>Indicate the dominant type and record the dominant species present</b> <input checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input checked="" type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous dominant species present <u>Cottonwood, dogwood, loosestrife, mowed grass</u>	
<b>INSTREAM FEATURES</b>	Estimated Reach Length _____ m Estimated Stream Width <u>250 m</u> Sampling Reach Area <u>12 ft<sup>2</sup></u> Area in km <sup>2</sup> (m <sup>2</sup> x 1000) _____ km <sup>2</sup> Estimated Stream Depth <u>35-4 ft</u> Surface Velocity (at thalweg) <u>0 m/sec</u> <u>standing water</u>	Canopy Cover <input type="checkbox"/> Partly open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded <u>open</u> High Water Mark _____ m <u>water level high</u> Proportion of Reach Represented by Stream Morphology Types <input type="checkbox"/> Riffle _____ % <input checked="" type="checkbox"/> Pool <u>100</u> % <input type="checkbox"/> Run _____ % Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <u>only at outlet</u> Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <u>dam at mill pond</u>
<b>LARGE WOODY DEBRIS</b>	LWD <u>590 m</u> <u>Large sticks in dredge</u> Density of LWD _____ m <sup>3</sup> /km <sup>2</sup> (LWD/ reach area)	
<b>AQUATIC VEGETATION</b>	<b>Indicate the dominant type and record the dominant species present</b> <input checked="" type="checkbox"/> Rooted emergent <input type="checkbox"/> Floating Algae <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Attached Algae <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating dominant species present <u>Spadflower (Nuphar luteum)</u> Portion of the reach with aquatic vegetation _____ %	
<b>WATER QUALITY</b>	Temperature <u>27.7°C</u> Specific Conductance <u>492.00 µS/cm</u> Dissolved Oxygen <u>7.67 ppm</u> pH <u>7.45</u> Turbidity <u>16.1 NTU</u> WQ Instrument Used <u>YSI</u> <u>ORP - 78.5</u>	<b>Water Odors</b> <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____ <b>Water Surface Oils</b> <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globes <input type="checkbox"/> Flecks <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____ <b>Turbidity (if not measured)</b> <input type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Turbid <input type="checkbox"/> Other _____
<b>SEDIMENT/SUBSTRATE</b>	<b>Oils</b> <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Chemical <input type="checkbox"/> Other _____ <input type="checkbox"/> Sewage <input type="checkbox"/> Anaerobic <input type="checkbox"/> Petroleum <input type="checkbox"/> None <b>Oils</b> <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse	<b>Deposits</b> <input type="checkbox"/> Sludge <input type="checkbox"/> Relict shells <input type="checkbox"/> Sawdust <input checked="" type="checkbox"/> Other <u>plastic debris</u> <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand <b>Looking at stones which are not deeply embedded, are the undersides black in color?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <u>N/A</u>

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	< 10%
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	90% man-made roots
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	20	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	60			
Clay	< 0.004 mm (slick)	0			

## HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME <u>Jackson Pond</u>		LOCATION <u>TPSD - TT0603</u>	
STATION # <u>TT0603</u> RIVERMILE		STREAM CLASS	
LAT _____	LONG _____	RIVER BASIN	
STORET #		AGENCY	
INVESTIGATORS <u>Roberts, Hawkins, O'Neill</u>			
FORM COMPLETED BY <u>Roberts</u>		DATE <u>6/26/01</u> TIME <u>2:30</u> AM (PM)	REASON FOR SURVEY

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	<b>1. Epifaunal Substrate/ Available Cover</b>  <div style="text-align: center; font-size: 2em;">11</div>	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	<del>20</del> 19 18 17 16	<del>15</del> 14 13 12 11	<del>10</del> 9 8 7 6	<del>5</del> 4 3 2 1 0
	<b>2. Pool Substrate Characterization</b>  <div style="text-align: center; font-size: 2em;">8</div>	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	<del>20</del> 19 18 17 16	<del>15</del> 14 13 12 11	<del>10</del> 9 8 7 6	<del>5</del> 4 3 2 1 0
	<b>3. Pool Variability</b>  <div style="text-align: center; font-size: 2em;">N/A</div>	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	<del>20</del> 19 18 17 16	<del>15</del> 14 13 12 11	<del>10</del> 9 8 7 6	<del>5</del> 4 3 2 1 0
<b>4. Sediment Deposition</b>  <div style="text-align: center; font-size: 2em;">2</div>	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
SCORE	<del>20</del> 19 18 17 16	<del>15</del> 14 13 12 11	<del>10</del> 9 8 7 6	<del>5</del> 4 3 2 1 0	
<b>5. Channel Flow Status</b>  <div style="text-align: center; font-size: 2em;">20</div>	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
SCORE	<del>20</del> 19 18 17 16	<del>15</del> 14 13 12 11	<del>10</del> 9 8 7 6	<del>5</del> 4 3 2 1 0	

pond

TTC0603

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
<p>6. Channel Alteration</p> <p>15</p>	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<p>7. Channel Sinuosity</p> <p>2</p>	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<p>8. Bank Stability (score each bank)</p> <p>SCORE 7 (LB)</p> <p>SCORE 7 (RB)</p>	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
<p>9. Vegetative Protection (score each bank)</p> <p>Note. determine left or right side by facing downstream.</p> <p>SCORE 5 (LB)</p> <p>SCORE 5 (RB)</p>	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common, less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
<p>10. Riparian Vegetative Zone Width (score each bank riparian zone)</p> <p>SCORE 1 (LB)</p> <p>SCORE 1 (RB)</p>	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score 74

created ponds > 25 yrs old,

Bank - vegetation 1 m. mowed > 1 m

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(FRONT)**

STREAM NAME <i>Hall's Brook</i>	LOCATION <i>IPSD-H300</i>	<i>Ref Wetland</i>
STATION # <i>IPSD-H300</i>	RIVERMILE _____	STREAM CLASS _____
LAT _____	LONG _____	RIVER BASIN _____
STORET # _____	AGENCY _____	
INVESTIGATORS <i>Roberts, O'Neill, Hoskins</i>		
FORM COMPLETED BY <i>Roberts</i>	DATE <i>6/26/01</i> TIME <i>11:50</i> (AM) (PM)	REASON FOR SURVEY <i>Triad Sampling</i>

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input checked="" type="checkbox"/> %cloud cover <input checked="" type="checkbox"/> clear/sunny	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> % <input type="checkbox"/>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>showers 6/24</i> Air Temperature <i>90</i> °C Other _____

SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph) <i>Acced from Danforth Street</i> 
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STREAM CHARACTERIZATION	Stream Subsystem <input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal	Stream Type <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater
	Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed <input type="checkbox"/> Non-glacial montane <input type="checkbox"/> Mixture of origins <input type="checkbox"/> Swamp and bog <input checked="" type="checkbox"/> Other <i>Urban</i>	Catchment Area _____ km <sup>2</sup>

*Danforth*

H300

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET  
(BACK)

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Other _____ <input checked="" type="checkbox"/> Residential	<b>Local Watershed NPS Pollution</b> <input checked="" type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources  <b>Local Watershed Erosion</b> <input checked="" type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy
<b>RIPARIAN VEGETATION (18 meter buffer)</b>	Indicate the dominant type and record the dominant species present <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous dominant species present <u>Red maple, speckled alder, cattails</u>	
<b>INSTREAM FEATURES</b>	Estimated Reach Length _____ m Estimated Stream Width <u>31 m</u> Sampling Reach Area <u>842 m<sup>2</sup></u> Area in km <sup>2</sup> (m <sup>2</sup> x 1000) _____ km <sup>2</sup> Estimated Stream Depth <u>0.5-1.0'</u> Surface Velocity _____ m/sec (at thalweg) <u>low but detectable flow</u>	
<b>LARGE WOODY DEBRIS</b>	LWD _____ m <sup>2</sup> <u>10%</u> Branches in channel. Density of LWD _____ m <sup>2</sup> /km <sup>2</sup> (LWD/reach area)	
<b>AQUATIC VEGETATION</b>	Indicate the dominant type and record the dominant species present <input type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating <input type="checkbox"/> Floating Algae <input type="checkbox"/> Attached Algae dominant species present <u>not in channel, banks, cattails</u> Portion of the reach with aquatic vegetation <u>0%</u> <u>duckweed</u>	
<b>WATER QUALITY</b>	Temperature <u>24.0c</u> Specific Conductance <u>341.00</u> Dissolved Oxygen <u>6.92</u> pH <u>7.01</u> Turbidity <u>12.5</u> WQ Instrument Used <u>YST</u> <u>all - 72.7</u>	
<b>SEDIMENT/SUBSTRATE</b>	<b>Odors</b> <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____  <b>Oils</b> <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse	
	<b>Deposits</b> <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand <input type="checkbox"/> Relict shells <input checked="" type="checkbox"/> Other <u>none</u>  <b>Looking at stones which are not deeply embedded, are the undersides black in color?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <u>N/A</u>	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	40%
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	60%
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	0	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	100%			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME *Hall's Brook* LOCATION *IPSD-HB00* *Wetland Ref*  
 STATION # *H800* RIVERMILE \_\_\_\_\_ STREAM CLASS \_\_\_\_\_  
 LAT \_\_\_\_\_ LONG \_\_\_\_\_ RIVER BASIN \_\_\_\_\_  
 STORET # \_\_\_\_\_ AGENCY \_\_\_\_\_  
 INVESTIGATORS *Roberts, O'Neill, Haskins*  
 FORM COMPLETED BY *Roberts* DATE *6/26/01* REASON FOR SURVEY *Triad sampling*  
 TIME *11:55 AM* PM \_\_\_\_\_

Habitat Parameter	Condition Category				
	Optimal	Suboptimal	Marginal	Poor	
1. Epifaunal Substrate/ Available Cover 15 SCORE	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization 10 SCORE	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	3. Pool Variability 3 SCORE	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	4. Sediment Deposition 5 SCORE	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	5. Channel Flow Status 20 SCORE	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

*150% mud mass snags sticks CPOM*

*mud some POE*

*all shallow emerge*

*high stage*

H300

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
<b>6. Channel Alteration</b> 1 20	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE 20	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>7. Channel Sinuosity</b> N/A	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length <u>2</u> times longer than if it was in a straight line. 2-3	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
	SCORE 10	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>8. Bank Stability (score each bank)</b> SCORE 10 (LB) SCORE 10 (RB)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
	Left Bank SCORE 10	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	Right Bank SCORE 10	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>9. Vegetative Protection (score each bank)</b> Note: determine left or right side by facing downstream. SCORE 10 (LB) SCORE 10 (RB)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	Left Bank SCORE 10	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	Right Bank SCORE 10	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>10. Riparian Vegetative Zone Width (score each bank riparian zone)</b> SCORE 10 (LB) SCORE 10 (RB)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
	Left Bank SCORE 10	8 7 6	5 4 3	2 1 0
	Right Bank SCORE 10	8 7 6	5 4 3	2 1 0

Total Score 133

Attachment 1

## FIELD NOTES FOR JUNE 2001 WELLS G&H TRIAD SAMPLING

The following field notes were compiled in order to detail the sampling activities in support of the triad sampling at Wells G&H between June 18 and June 27, 2001. These notes are organized in chronological order. Physical Characterization and Habitat Assessment Field Data Sheets for each of these locations were also completed for each station.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-SD-WH-07

**Date:** June 18, 2001

**Time:** 11:10 am

**Weather:** Sunny, 80°F, light breeze

Sampling team met at the MA Rifle Association parking lot, at the end of Rifle Range Road in Woburn, at 9:15 am. The first station sampled, west of the rifle range, was the TTNUS sample location WH07. The station is located at the edge of the red maple swamp along the eastern border of the Well G& H 23-acre wetland. There had been heavy rains (estimated at 2.5 inches) in the last 24-hours. Water levels in the wetland were high for June due to this rain event, as evidenced by the depth of water around emergent vegetation including sensitive ferns. The site appears to be a seasonally inundated palustrine forested wetland. The open emergent marsh, dominated by common reed (*Phragmites australis*) is located approximately 50 ft to the west.

The sediment samples were collected in 1.2 ft of water, just west of the WH07 stake. The sediment was dark muck with a high content of coarse particulate organic matter. The three samples sieved for benthic community analysis were composed predominantly of leaf litter. A layer of moss was present floating just above the sediment surface. There was no observable flow of water at the site.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-SDTT-22-01

**Date:** June 18, 2001

**Time:** 3:30 pm

**Weather:** Sunny, 85°F, light breeze

Station SDTT 22-01 was accessed through the northern fence of the Rifle Association property. The former stake marking TTNUS's sampling location was located. The area in the vicinity of the sample site is a palustrine forested wetland, dominated by red maple (*Acer rubrum*), swamp azalea (*Rhododendron viscosum*), and skunk cabbage (*Symplocarpus foetidus*).

The sample was collected within a small channel (2 ft wide) with slow, but detectable flow, through the red maple swamp. The banks were densely vegetated with maples, shrubs, and a herb layer dominated by skunk cabbage, cinnamon fern (*Osmunda cinnamomea*), jewelweed (*Impatiens capensis*) and lurid sedge (*Carex lurida*). In the channel itself, emergent and submersed aquatic vegetation was absent. The sediment was composed of dark highly organic muck with a high content of coarse particulate organic matter. In the samples sieved for benthic

community analysis, small beads, presumed to be lead shot from historic rifle range activity were found. The access road, which parallels the wetland to the east was covered in buck shot.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-SDTT-12-03

**Date:** June 19, 2001

**Time:** 9:30 am

**Weather:** Sunny, 80°F, light breeze

Station SD 12-03 along the secondary channel of the Aberjona River near Well H in the 23-acre wetland. This location was characterized as a stream habitat and was collected in a depositional area of a side channel along the edge of the emergent marsh. The marsh vegetation was dominated by narrow-leaved cattail (*Typha angustifolia*), purple loosestrife (*Lythrum salicaria*) and tussock sedge. A few shrubs adjacent to the sampling location included button-bush and elderberry (*Sambucus canadensis*), although the area was generally open emergent marsh.

The sediment was composed of dark organic muck, with a high proportion of coarse particulate organic matter consisting mainly of cattail fragments. The main channel of the stream at this location was approximately 5-8 feet wide with moderate flow and 4 ft deep at the center. The small side channel where the sample was collected was 0.8 to 1.2 feet deep. The emergent marsh adjacent to the sample area is covered in dense vegetation and pockets of water.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-SDTT29-03

**Date:** June 19, 2001

**Time:** 11:50 am

**Weather:** Sunny, 85°F, light breeze

SDTT-29-03 is south of Well H on the east branch of the river within the 23-acre wetland. This location was characterized as a stream habitat, and was collected adjacent to a small inlet in the wetland which forms a pool bordered by emergent wetland. The stream channel is distinct, deeper and wider than at SD-12-03. There is no canopy and few shrubs. The wetland vegetation is dominated by tussock sedge (*Carex stricta*), purple loosestrife and some cattails. The sediment was collected at a depth of 0.8 to 1.2 feet of water. The sediment was composed of dark organic muck with fine roots and slightly less undecomposed cattail fragments.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-SDTT-19-01

**Date:** June 19, 2001

**Time:** 2:30 pm

**Weather:** Sunny, 90°F, light breeze

Station SD19-01 is in the 23-acre wetland west of Well G. This wetland sediment sample was

located in a isolated pocket or channel in the emergent wetland among tussock sedge. This open channel in the emergent wetland is not directly connected to the main channel of the river. The sediment samples were collected at a depth of 0.8 feet. Sediment consisted of dark organic muck with a higher content of fine particulate organic matter. Some orange floc was noted on the surface of the sediment. There was no tree or shrub cover. A dense stand of *Phragmites* is located to the north, but in the vicinity of the sample, the vegetation was primarily sedges. The original Foster-Wheeler sample was taken near this location. The M&E (1997) sample was collected closer to the forested wetland to the east.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-TT33-02

**Date:** June 20, 2001

**Time:** 11:20 am

**Weather:** Sunny, 80°F, light breeze

Sample site TT33-02 is just off the main channel of the Aberjona River near the southern end of the former Cranberry Bog, south of Salem Street. This wetland habitat was located along a minor side channel (east-west). The substrate was difficult to sample with the dredge because of the fibrous roots and particulate organic matter. The sediment was black organic muck with a higher sand component than many of the wetland samples. The dominant vegetation in the vicinity of the sample station included tussock sedge and purple loosestrife. The emergent marsh was mainly open in this area, but a few shrubs, mainly silky dogwood (*Cornus amomum*) were located adjacent to the sample location.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-TT32-02

**Date:** June 20, 2001

**Time:** 2:00 pm

**Weather:** Sunny, 90°F, light breeze

Sample station TT32-02 was also located within the former Cranberry Bog, north of TT33-02. The station was very similar in character to the wetland sample collected at TT33-02. The sediment was collected at the mouth of one of the small side channels to the main stream. There was almost no flow in the channel and the sediment was collected in a depositional area 0.4-0.8 ft of water depth. The vegetation bordering the sampling location was dominated by emergent, hummock-forming grass, and purple loosestrife. The sediment consisted of organic muck and some sand. The organic content and fine root fraction was also high, making dredging difficult. The dredge pressed in 6 inches into the substrate and frequently recovered only 2-3 inches of material for the chemistry and toxicity samples.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-WW-06

**Date:** June 21, 2001

**Time:** 8:55 am

**Weather:** Cloudy, 70°F, light breeze

Station WW-06 is located along the eastern edge of the Wildwood Property. The station is at the out edge of the narrow forested wetland that borders the gravel cap for the treatment system at Wildwood. The sample was collected among clumps of emergent wetland plants including sensitive fern (*Onoclea sensibilis*) and purple loosestrife. The location is partially shaded by red maple trees and a few shrubs (norther arrowwood) were located adjacent to the sampling area.

The sediment was black organic sediment with many fine roots and cohesive structure. In order to get a sample, the jaws of the dredge had to be manually pushed closed. Water depth was 0.5 - 1.0 feet. The area appears to be a seasonally inundated location.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-TT-18-02

**Date:** June 21, 2001

**Time:** 2:30 pm

**Weather:** Cloudy, 75°F, light breeze

The sample station was located on the east side of the Aberjona River and determined by the GPS co-ordinates for SD-18-02 recorded by M&E. The station was accessed by launching a boat from Wildwood. The location is a small inlet along the main river channel. The vegetation along the bank was dominated by tussock sedge and purple loosestrife. The banks of the stream are emergent marsh with a few red maple saplings present. The sediment was black organic muck, with a high content of fine particulate organic matter. Samples were collected in water 1.1 ft deep.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-SDTT-10-02

**Date:** June 22, 2001

**Time:** 8:45 am

**Weather:** Cloudy, 75°F, light breeze

Sampling location SD-10-02 is located on the Aberjona River, just upstream of the bridge at Salem Street. This location is at the southern end of the 23-acre wetland and upstream of the Cranberry bog. Access was obtained through the backyard of a residence on Salem street to the west. A boat was used to collect the sample. GPS was used to locate the M&E co-ordinates for SD-10-03. This area is a wide point in the river with slow flow. The sample was collected in 1.4 feet of water at the northeast edge of a patch of water lilies (*Nuphar luteum*). The sediment was composed of black organic muck with a high content of coarse particulate organic matter. The

riparian vegetative zone was limited on the western bank to a narrow shrub/tree border sloping up to a mowed residential lawn. The remainder of the surrounding banks were dominated by emergent vegetation including cattails and purple loosestrife.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-SDTT-13-01

**Date:** June 22, 2001

**Time:** 10:45 am

**Weather:** Cloudy, 70°F, light breeze

The location of the stake for station SD13-01 (Foster Wheeler) was determined with GPS coordinates. The location of the former SD13-01 was in an area of a scoured channel at the western edge of the 23-acre wetland, north of Wildwood. The area was inundated with water, but a location about 15 feet to the east was selected to sample. This location was a small channel into the adjacent to the emergent wetland. The sample was collected in the open water, 0.3 - 0.4 feet deep, adjacent to clumps of purple loosestrife and jewelweed.

The western bank, about 100 feet from the railroad tracks, consisted of a disturbed forest, dominated by oak. Shrubs, including northern arrowwood (*Viburnum recognitum*), were prevalent along the bank. The open water channel was about 20 feet wide and up to 2 feet deep. The sediment consisted of black organic muck, with some of the dredge samples with a higher content of peaty material.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-TT30-01

**Date:** June 22, 2001

**Time:** 1:20 pm

**Weather:** Partly cloudy, 75°F

The sample was collected in a very small inlet on the east side of the stream channel south of Salem Street. The station was accessed from a parking lot off the south side of Salem Street. There was moderate flow in the channel and slow flow at the sampling location behind a small clump of purple loosestrife. The western shoreline was a narrow band of forest including willow, red maple and gray birch. The sample was collected in an open area of emergent marsh dominated by purple loosestrife, tussock sedge and sensitive fern at a depth of 3-10 inches. The sediment was composed of black organic muck, fibrous roots, and some peat.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-SD-PP03

**Date:** June 25, 2001

**Time:** 10:10 am

**Weather:** Partly cloudy, 76°F

Phillips Pond was a reference location located on the South Branch of the Aberjona River between Commercial Way and Route 93. Access was obtained from road behind the Marshall's loading docks. The pond was sampled using an Ekman dredge from a boat. Station IPSD03 is located off the southern shore about halfway up the pond. The sediment was collected at a depth of about 13 feet. Soft black organic muck was collected at the location determined from GPS coordinates provided in Menzie-Cura's data. While anchored at the same location, in some areas there was little recovery in the dredge and it felt like it was hitting hard bottom.

The pond was create in the mid-1970's. There is an active beaver dam at the outlet, and the water levels appeared to be quite high. The bordering vegetated buffer is a narrow forest (red maple gray birch, glossy buckthorn (*Rhamnus frangula*) and dogwood ), with the exception of the west side, with is *Phragmites* and a bank up to the roadway. Beaver activity, muskrat and Great Blue Heron were observed at the pond. Ken Munney reported that a large number of bass were collected from this pond during the fish sampling.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-SD-TTSA01

**Date:** June 25, 2001

**Time:** 2:00 pm

**Weather:** Mostly sunny, 85°F

A new wetland reference station was selected in the Town of Reading, at the end of Arcadia Road. The station is located off the north side of the cul-de-sac at the edge of the forested wetland in a small open channel (no flow) in the emergent wetland. At the time of sampling the water depth was 0.7 ft. At the sampling location there was no canopy cover, however, to the south and west (upstream), a mix of shrub and forested wetland was dominated by red maple, and northern arrowwood. Vegetation at the TTSA01 included broad-leaved cattail, skunk cabbage, jewel weed, purple loosestrife and sensitive fern. This vegetative community was characteristic of the emergent marsh along the edges of the open channel in the wetland where the sample was taken. There was no rooted aquatic vegetation where the sediment was collected. The sediment consisted of black organic muck, on top of a sandier layer. There was a fairly high content of coarse particulate organic matter in the samples.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-TTSD01

**Date:** June 25, 2001

**Time:** 4:00 pm

**Weather:** Mostly sunny, 85°F

TTSD01 is a stream reference location on the South Branch of the Aberjona River. The station is located behind residences on Willow Street in Reading. Access to the site was obtained through the back yard of #118 Willow Road. The stream is 8-10 feet wide, with forested wetland along the east bank and emergent/shrub wetland along the west bank. Shrubs along both banks included

silky dogwood and glossy buckthorn. Trees were predominately red maple. Along the banks, the dominant herbaceous species included jewelweed and sensitive fern.

The substrate on west side of the stream channel was scoured and sandy. The sample was collected in the depositional area on the east side of the channel. The sediment was black organic muck, with some sand, and a high content of coarse organic matter. There were numerous sticks and woody debris. A few rooted macrophytes (*Ludwigia palustris*) were observed in the area of the sample collection.

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-TT04

**Date:** 6/26/01

**Time:** 9:30 am

**Weather:** Sunny, 85°F

This station was a reference stream location, on Hall's Brook accessed from a dead-end street (Third Road). This station was used by Menzie-Cura for a reference stream for the Industri-Plex triad sampling. There is a distinct stream channel present through a wide emergent marsh dominated by reed canary grass. The sample was taken on the western end of the marsh in an area where the stream is bordered by a few shrubs and then flows into a forested wetland.

The sediment was collected along the reed-canary grass bank and consisted of a black organic muck. The substrate toward the center of the channel (not sampled) was sandy. Dogwood, speckled alder (*Alnus rugosa*) and elderberry were present along the northern bank. Other emergent wetland species present in the area included purple loosestrife and broad-leaved cattail (*Typha latifolia*).

**Project name:** Wells G&H Sediment Triad Sampling 2001

**Sample Location:** IP-HB00

**Date:** June 26, 01

**Time:** 11:50 am

**Weather:** Sunny, 90°F

This reference wetland, along Hall's Brook, was accessed from a dead-end street (Danforth) off of School Street in Woburn. The wetland was reached by going down a steep bank from the residential area and west along the bank, out to a peninsula that runs north into the wetland. The station is on the west side of the wetland adjacent to an scrub/shrub wetland dominated by speckled alder. The sample was taken in a channel in the wetland with no flow, among cattails. The water depth at the sampling location was 0.5 to 1.0 feet. The sediment was deep (approximately 2 ft) dark organic muck with coarse organic matter. There was duckweed (*Lemna* sp.) on the surface of the water among the cattails, and other emergent vegetation included purple loosestrife and for-get-me-nots (*Myosotis scorpioides*).

**Project name:** Wells G&H Sediment Triad Sampling 2001  
**Sample Location:** IP-SD-TT06-03  
**Date:** June 26, 2001  
**Time:** 3:00 pm  
**Weather:** Sunny, 90°F

The sample location for Judkins Pond was located using co-ordinates for the M&E SD-06-03 station. Judkins Pond is a small pond in the center of Winchester. The sampling location is on the east side of the pond near a patch of water lilies (*Nuphar luteum*). The sample was collected at a depth of 3.5 - 4 feet. The sediment consisted of dark black organic muck with many fine roots and some sand in the sieved benthic community samples. Undisturbed vegetation grows along the bank in a narrow buffer, but the majority of the riparian zone consists of mowed grass, buildings and roadways.

**Project name:** Wells G&H Sediment Triad Sampling 2001  
**Sample Location:** IP-SD-TTUF-02  
**Date:** June 27, 2001  
**Time:** 9:30 am  
**Weather:** Sunny, 75°F

This was one of two samples collected in the Upper Forebay of Upper Mystic Lake. The eastern shore of the pond is bordered by a park, and the western shore is residential. The samples were collected by boat, launched from the park on Mystic Valley Parkway. The first sample was collected in a bay on the western shore. Many of the residences on the shoreline have seawalls. The water depth at the station was 7.1 feet. The sediment consisted of black organic muck with little coarse organic matter. There was a patch of water lilies (*Nymphaea odorata*) approximately 6 ft from the sample location. Lilies were prevalent elsewhere on the pond. Cormorants and geese were present on the pond. Bluegills were noted along the eastern shore, and larger fish were jumping near the center of the lake.

**Project name:** Wells G&H Sediment Triad Sampling 2001  
**Sample Location:** IP-SD-TTAAO-03  
**Date:** June 27, 2001  
**Time:** 11:30 am  
**Weather:** Sunny, 85°F

The second station in the Upper Forebay was located closer to the inlet of the Aberjona River. The sample was collected at a water depth of 5 ft. The sediment was similar with some leaf matter in the samples.