Tidal Stream Restoration Design

Joint Task Force Meeting (February 28, 2011)
Overall Design Summary / Basis

Current Progress Updates (60% - 90%)
- Watermarks
- Litter Control
- Constructibility Review
- Grading Plans

Construction Phasing / Implementation

Updated Costs Estimates (In- vs Near-Stream)
Project Goals

- Increase the ecological integrity through the tidal corridor area
- Maintain sufficient flood control to the surrounding community
- Develop a channel design that promotes stability and self-sustainability
- Provide public access opportunities to encourage interactivity between the stream and the public
Overall Design Summary / Basis

- Existing Condition Cross Section

- MHHW = EL. 1.54'
- MLLW = EL. -1.44'
- Existing Trail
- Existing Rip-Rap
- Existing Ground
Overall Design Summary / Basis

- Proposed Condition Cross Section (Balanced Section)

MHHW = EL. 1.54'

MLLW = EL. -1.44'

Existing Trail

Existing Rip-Rap

ENGINEERED LOG JAM

PLANTINGS

Existing Ground
Overall Design Summary / Basis

- Proposed Condition Cross Section
  Low Tide Elevation

MHHW = EL. 1.54’

MLLW = EL. -1.44’
Overall Design Summary / Basis

- Proposed Condition Cross Section

High Tide Elevation

MHHW = EL. 1.54'

MLLW = EL. -1.44'

Existing Trail

Existing Rip-Rap

ENGINEERED LOG JAM

PLANTINGS

Existing Ground
Overall Design Summary / Basis

- Implemented Design Parameters
  - Riverine / Tidal Transition
  - Sediment Management
  - Floodplain Conveyance
  - Habitat Diversity
Overall Design Summary / Basis

- Implemented Design Parameters (cont'
  - Engineered Log Jams
  - Geocell Walls
Implemented Design Parameters (con’t)

- Planting Zones
  - Promote Diversity, Avoid Monoculture

<table>
<thead>
<tr>
<th>PLANT ZONE ELEVATIONS</th>
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<tbody>
<tr>
<td>ZONE 1</td>
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<td>ZONE 2</td>
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<td>ZONE 3</td>
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<tr>
<td>MHHW = 1.54 FT. NAVD 1988</td>
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<tr>
<td>MLLW = -1.44 FT. NAVD 1988</td>
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Tidal Stream Restoration Design
Current Progress Updates (60% - 90%)

- Field Investigations
- D.I.R.T. Studios - Watermarks
- Litter Control – Draft Concepts
- Constructability Review
  - Construction Phasing
- Grading Plans
Current Progress Updates (60% - 90%)

- Field Investigations
  - Geotechnical Borings, Investigations, Testing
    - Field work complete, testing now
- Structural Design
Current Progress Updates (60% - 90%)

- D.I.R.T. Studios (Watermarks – Blue locations)

**watermark location map**
23 watermarks, 17 in Arlington, 5 in Alexandria
Current Progress Updates (60% - 90%)

- D.I.R.T. Studios (Watermarks)

**Watermark types: option A**
where the ground is level on both sides of the path for at least 3 feet

**Watermark types: option B**
where the ground slopes away from the path on the water-side
Current Progress Updates (60% - 90%)

- Litter Control
  - Concepts
    - Inlet control vs. Outlet Control (In-Stream)
    - Public Education

- Design Challenges
  - Initial Cost
  - Compatibility
  - Obstacles in Stream
    - (ELJs, Rock Vanes, Benches)

- Types of Outlet Control
  - Skimmer Boats
  - Watergoats
  - Bandalong
  - Nettech
Current Progress Updates (60% - 90%)
Litter Control – Potential Concepts

Nettech Traps on Outfalls
- Collects at each outfall
- Easy installation, no impact to flow
- Minimal trash seen at smaller pipes

Bandalong Under Bridge
- Additional catchment at the beginning and end of project area
- Success in this region

Project Team currently considering alternatives
Current Progress Updates (60% - 90%)

- Draft Grading Plan
  - Tie-ins
  - Pipe Extensions
  - Trails (?)
Current Progress Updates (60% - 90%)

- Constructability Review
  - Staging Areas
  - Water Pollution Control Outfall
  - Access for Channel Excavation
Current Progress Updates (60% - 90%)

- Constructability Review
- Staging Areas
Current Progress Updates (60% - 90%)

- Constructability Review
- Water Pollution Control Outfall
Current Progress Updates (60% - 90%)

- Constructability Review
  - Access for Channel Excavation
    - Option 1: Causeways
    - Option 2: Small Barge / Floating Dock
    - Option 3: Sheet Piles / Dewatering
Updated Cost Estimate (approximate)

- In-Stream Elements
  - Tidal Restoration $7 M
  - Construction Inspection / Administration (13+%) $1 M

Overall Project (In-Stream) $8 M

Current Funding ≈ $5M ($3M EPA STAG Fund)
Near-Stream Elements
- Near-Stream (Alexandria) $3 M
- Near-Stream (Arlington) $2 M
- Construction Inspection / Administration (13+%) $0.7 M

STAG funding cannot be used for non-environmental purposes
Each jurisdiction is establishing schedule for funding, planning and design
Certain elements within the In-Stream construction zone (e.g. trails) may be included with Tidal Stream Restoration Project
Construction Phasing/Implementation

- 90% Submittal – Early Spring
  - Arlington will administer the construction
  - Interim submittals will be presented as needed
- Finalize Demonstration Project Limits
- Final Construction Documents (90% - 100%)
- Advertisement
Tidal Stream Restoration Design

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Current Progress Updates (60% - 90%)

- D.I.R.T. Studios (Watermarks)
- Possible materials

1. **cast-in-place concrete**
   - Painted blue
   - With blue pigment
   - Textured
   - Embedded glass aggregate

2. **cast-in-place resin-bound glass aggregate**
   - Installing resin-bound glass aggregate
   - Loose glass aggregate

3. **pre-cast options**
   - Wausau Tile
   - Custom pre-cast pavers
   - Custom concrete stamp + stamped concrete

Additional images:
- Tubelights: paver light + fiber optics
- LED resin flexible, embedded tube lights, night view, embedded tube lights, day view
- Brick paver lights, brick pavers installed, fiber optics, fiber optics embedded in aggregate