

Erosion, Sediment and Stormwater Control Plan & Nuisance Dust Control Plan

Birch Swamp Road Site

Town of Warren, Bristol County, Rhode Island

Prepared For:



U.S. Environmental Protection Agency
Region I
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1.0 INTRODUCTION

This combined Erosion, Sediment and Stormwater Control Plan and Nuisance Dust Control Plan (hereinafter referred to as the ESS&D Control Plan) was prepared by Shaw Environmental, Inc. in support of the U.S. Environmental Protection Agency (EPA) to provide the necessary Best Management Practices (BMPs) to control the impacts from potential wind erosion (dust) and runoff events (rain or snow melt) to existing down gradient wetlands and waters at the Birch Swamp Road site (the “site”) located in the Town of Warren, Bristol County, Rhode Island. The ESS&D Control Plan was developed using accepted industry standards for dust control and runoff events with their accompanying soil erosion and through consultation with the Massachusetts Department of Environmental Protection (MADEP) and Massachusetts Office of Coastal Zone Management (CZM) guidelines. Specifically, the *Erosion and Sedimentation Control Guidelines for Urban and Suburban Areas* (MADEP, 2008) and the *Stormwater Management Volumes 1 and 2* (MADEP, 1997). This ESS&D Control Plan is a living document and will be modified as site conditions change as soil removal activities progress.

The site is approximately 1 acre in size, located in woods and fields off Birch Swamp Road in Warren, Bristol County, Rhode Island as shown on a U.S. Geological Survey (USGS) topographic map (Figure 1) and Road Map (Figure 2). The Site is further identified as portions of Lots 4 (Estate of Amilio Zompa) and 175 (Chace) on the Warren Tax Assessor’s Map 22 (Deed Book 103, Page 566 and Deed Book 133, Page 1126, respectively). Vehicles may access the site via an unimproved road from the west from Birch Swamp Road. Residential properties bound the north and south of the access road along Birch Swamp Road. The Rubino property on the south side of the access road is marked by a stone wall. The Fortin property on the north side of the access road is marked by a row of arborvitae. The Chace property consisting of open fields and forested wetlands bound the remainder of the access road to the west of the Rubino and Fortin properties and surround the Zompa property. The property boundaries are shown on the Sample Location Map (Figure 3).

The site formerly housed a mill. The concrete foundation is all that remains. A culverted intermittent stream runs under the access road approximately 150 feet east of the foundation. The site has become overgrown with trees and shrubs. The general topography of the site is gently downward sloping from the west (Birch Swamp Road) to the east (intermittent stream). The nearest named surface water to which the unnamed intermittent stream likely drains is the Kickemuit River and Warren Reservoir, a drinking water source. A low lying forested wetland lies to the west of the foundation.

This ESS&D Control Plan focuses on the access road and the foundation area. Resource areas of concern include the arborvitae, stone wall, forested wetland and the intermittent stream. The location of existing and proposed “Best Management Practices” (BMPs) to adequately protect these resource areas is provided in Figure 3 and described in the following sections.

2.0 BEST MANAGEMENT PRACTICES (BMPs)

Runoff events can result from stormwater sheet flow over a surface, discharge of contained water or melting snow cover that results in a concentrated flow of melting water. Additionally, arid conditions typically encountered during the summer months, coupled with large expanses of non-vegetated areas (e.g., access roads) may lead to nuisance dust impacts. Erosion of upland soils into wetlands and waterways and nuisance dust impacts may be mitigated by the implementation of control measures or BMPs adequately designed to reduce the potential impact to these resource areas.

Existing, dense vegetated barriers mitigate certain impacts to resource areas; however, several areas within the confines of the site and along its construction boundary, including areas planned for vegetation removal, are vulnerable to wind erosion and runoff events. For these areas, additional control measures are warranted. As such, several BMPs have been selected to provide the required, most practicable control of potential nuisance dust and runoff events that could impact the downgradient resource areas.

This section identifies proposed BMPs for the site as well as general BMP maintenance and inspection recommendations. However, additional BMPs or adjustments to proposed BMPs may be necessary as site conditions change.

2.1. Proposed BMPs

As shown in Figure 3, Shaw proposes the installation of BMPs in specific areas to provide peripheral control to minimize offsite flow of sediments into the receiving waters and wetlands, and adjacent residential properties. These BMPs, detailed in Appendix A, include the following:

- Rock construction entrance (RCE) at the head of the site access from Birch Swamp Road;
- Straw bale barriers (SBB) in conjunction with filter fabric fence (FFF) along the access road within the forested wetland area;
- FFF and wire fence along the access road adjacent to the Fortin property;
- SBB and FFF along the access road over the culvert;
- FFF on three downslope sides of each soil excavation area and any temporary soil stockpiles; and
- SBB and FFF on three downslope sides of the large cluster of soil excavations near the southwest corner of the Zompa property.

These BMPs are recommended based on a current review and inspection of site activities; however, as construction progresses, these necessary BMPs will need to be reviewed. Potential future site activities that will likely require a subsequent review of necessary BMPs include vegetation clearing to access soil excavation areas and development of the access road.

BMP Inspection

BMPs will be inspected daily during active construction or equipment operation; weekly in areas with no construction or equipment operation and within 24 hours of each runoff (rain) event to ensure proper functioning. Inspection records, prepared by delegated individuals, will be maintained at the construction office trailer such that they are available for EPA review.

BMP Maintenance

BMP deficiencies will be addressed and corrected within 24 to 48 hours of identification. Some BMPs, such as rock construction entrances, will require more frequent maintenance, repair, or replacement. When the maximum sediment storage level is reached in a BMP, the sediment should be removed and disposed of in accordance with this ESS&D Control Plan. Written records of maintenance conducted should be maintained with the inspection reports and available for review as necessary.

BMP Soil Removal

Contaminant-free soil accumulated within specified BMPs (silt fence, straw bale barrier, etc.) will be disposed of in landscaped areas outside of steep slopes, wetlands, floodplains or drainage swales or placed in temporary soil stockpiles. Temporary soil stockpiles will be bounded on three sides with straw bales lined with poly sheeting and covered. In most cases, removed soil will be spread uniformly in an area of the site that is not in active use. Soil will be adequately covered or seeded for stabilization.

2.2. Dust Control Measures

The control of nuisance dust is critical to maintaining favorable neighbor relations and minimizing environmental impacts and equipment maintenance needs. A suppression approach utilizing strait water is anticipated.

Areas requiring dust control have been identified as the access roads within the work area and the work area itself. The frequency of vehicular traffic on these roads will likely be sufficient enough to warrant dust control during working hours. When necessary, dust control will be applied every working day to the access roads within the site. However, during the course of the project, supplemental applications of dust

control may be required for specific localized areas within the work area itself. EPA will conduct air monitoring throughout the cleanup to verify that dust control measures are working properly.

As the aerial extent of removal activity will be limited to small portions of the site at any one time and will be temporary in nature, traditional water application methods would be sufficient to control the nuisance dust. While the use of water is typically reserved for temporary measures (along public and private roads), its application as a dust control measure suits the site requirements: the access roads will only be in use during specific times of the day with a finite number of vehicles passing through each working day.

Minimum Equipment

Dust control will be achieved on the access road and in most work areas using a water truck. The water truck will have a hose for addressing areas not suited for vehicular access.

Water Source

The water truck will be filled at the town garage located opposite the access road on Birch Swamp Road, or alternatively from the local fire station, in coordination with local officials. The water will be drawn from a municipal water source and the supply is anticipated to be sufficient for project needs.

Application Rate

Using a systematic approach to the application of the dust control, uniform coverage would be achieved while allowing for supplemental applications to heavy use areas.

Use of Additives

Additives such as surfactants or “wetting agents” would only be employed if the traditional methods were insufficient to adequately control the nuisance dust, however the traditional strait water application is expected to be sufficient for this project. The drawback to the use of wetting agents or “surfactants” is their initial high cost; however, over the course of a large project, their use could substantially reduce the “total” quantity of water used on a project. Any determination toward the use of additives or alternative methods would be made on site after an evaluation of the success of the strait water applications.

There are numerous additives or alternative methods that could be used, including the following:

- Hygroscopic compounds (continually absorb moisture from the atmosphere) such as calcium chloride, magnesium chloride, hydrated lime and sodium silicates.
- Surfactant compounds (decrease the surface tension of water which allows available moisture to wet more particles per unit volume) such as soaps or detergents.
- Bitumens (derived from coal or petroleum) such as coherex peneprime, asphalt, oils, etc.

The use of additives could increase the coverage of dust control; however, the benefits could be overshadowed due to the proximity to resource areas, such as wetlands and watercourses. Use of additives would be implemented only after consultation with and approval by the EPA On-Scene Coordinator (OSC).

3.0 ABUTTER PROPERTY PROTECTION

Two abutting properties of particular concern are the stone wall on the Rubino property on the south and the arborvitae on the Fortin property on the north of the access road entrance off Birch Swamp Road. The access road improvements will include the removal of shrubs, vines and other select vegetation along its length to allow for equipment access to the soil removal areas. Although care will be taken to minimize impacts to the stone wall and arborvitae, limited impacts are possible.

3.1. Rubino Property – Stone Wall

The Rubino property boundary is marked by a stacked stone wall abutting the south side of the site access road. The condition of this stone wall prior to access road use and improvement was documented

in still photographs and video. The stone wall is currently overgrown with shrubs and vines making it difficult to note the pre-construction condition of each stone. However, large areas of existing collapse were noted where possible.

If single stones are moved during the access road improvement or usage, they will be replaced on top of the stone wall. If equipment contact with the stone wall results in stone displacement, the stones will be replaced to a stable condition. Any repair stone work will be performed with an intent to maintain the existing aesthetic of the stone wall.

3.2. Fortin Property – Arborvitae

The Fortin property boundary is marked by a row of arborvitae abutting the north side of the site access road. The condition of the arborvitae prior to access road use and improvement was documented in still photographs and video. Between the cable fence post at Birch Swamp Road to the back of the chicken pen, the row contained 58 arborvitae and one eastern red cedar. The arborvitae appeared in good condition and ranged in height from 2 to 18 feet.

The access road improvements will primarily be on the south side of the access road; however, overgrown vegetation, including shrubs that have sprouted under the arborvitae, will be removed during road improvement. A 4-foot high, green coated wire fence and staked silt fence will be installed at the edge of the access road along the arborvitae as a vehicle boundary. The fence will be wrapped around the southeast corner of the property in the area of the bird pen for approximately 20 feet for additional protection ensuring that the entrance to the abutting property fields remain open. The fence will serve as a barrier to the Fortin live poultry (chicken, ducks, etc.) that have been observed to wander from the property and cross along the access road; however, the EPA OSC has requested that the family secure their animals in the penned enclosure while cleanup work is occurring on-site. The silt fence stakes and wire fence supports are driven vertically in to the ground surface and, due to their spacing, will not harm the arborvitae root systems.

If arborvitae branches are broken due to close vehicular passage, they will be trimmed, however, every effort will be made (for example, through daily safety briefings, regular worker oversight, posted speed limits and signage, roadway maintenance, etc.) to prevent any accidental impacts to the arborvitae. Trimming will be performed with sharp tools to make a clean cut below the last evidence of a break. If the branch is broken to within a few inches of the main stem where trimming results in a visual gap through the arborvitae to the residential property, the tree structure should be assessed to determine if future growth can fill in the gap. Trees with large gaps may be considered for replacement at the discretion of the EPA.

Due to the tightly spaced existing arborvitae and the intertwined root systems, replacement of only slightly damaged (e.g., a few trimmed branches) arborvitae is not recommended. Removal of a damaged specimen would likely harm neighboring plants. Also due to the associated size of the root ball of a transplanted specimen and the tight spacing, it is not recommended to use any larger than a 5 to 6 foot high arborvitae (not including the rootball) for replacement. Arborvitae are fast growing and will fill in the space of any removed specimens in little time. Potential impacts to the one eastern red cedar in the hedge row will be evaluated in similar fashion.

3.3. Chace Property – Trees

The Chace property surrounds the majority of the access road length and work zones. Any trees removed during access road improvements, staging area set-up, excavation or other site activities will be replaced in kind per the general site restoration recommendations identified in the following section.

4.0 SITE RESTORATION

Site restoration will include backfilling open excavations with clean soils, replacement of trees and seeding of disturbed soils. All fill materials (e.g., soils, gravels, etc.) used for the project (for example, for site preparation or restoration) will be sampled and must be approved by the OSC prior to use at the site. Any fill materials that are used for the project (for example, gravels) and are to remain on-site following project completion will be sampled and must be approved by the OSC. Any trees removed along the access road during the initial widening will be replaced in kind, however, it is not currently expected that any trees will need to be removed along the access road. The replacement tree will be installed in the vicinity of the original tree at the discretion of the project manager and EPA. Dead or dying trees in proximity to the work areas that are removed for safety reasons will not be replaced. The replaced trees will be installed per industry standards (i.e., appropriate planting depth for rootball and tree crown) to enable successful root establishment and healthy future growth. Disturbed soils will be seeded to achieve vegetative stabilization upon project completion.

4.1. Seeding Specifications

The site currently includes forested wetlands and upland areas. Disturbed areas that could potentially contribute surface erosion to resource areas should receive one of the following seed applications upon completion of construction. The seed mix specifications are those of products available from New England Wetland Plants, Inc. based in Amherst, Massachusetts (<http://www.newp.com/seeds.html>); however, equivalent products are adequate if accepted by the project engineer.

Seed should be Certified Pure Live Seed within 12 months of application. Seed mix can be applied by a hand broadcast method, hand-held spreader, or hydro-seeded as long as there is no permanent snow cover. Lightly rake to ensure proper soil-seed contact. A concurrent application of clean, weed-free straw should be considered (spread by hand in a loose layer approximately 2 inches thick; or by mechanical methods using a bale chopper) when applying seed mixes. Seasonal seeding considerations and application rates are identified in the discussion of each type of seed mix below.

Wetland Seed Mix

The seed mix appropriate for wetland areas at the site is the "New England Wetmix." This wetland seed mix contains a wide variety of native seeds which are suitable for most wetland mitigation and restoration sites. This mix is composed of the wetland species most likely to grow in created/restored wetlands, and should produce more than 75% ground cover in two full growing seasons. The seeds will not germinate under inundated conditions.

This seed mix should be applied at 1 pound per 2,500 square feet. Seeding can take place on frozen soil, as the freezing and thawing weather of late fall and early winter will work the seed into the soil. If spring conditions are drier than usual, watering may be required. If planting during the summer months, watering may be required for at least 2-3 weeks after plating to ensure germination. A non-invasive annual such as winter rye may be added to the mix to obtain soil stabilization cover in the fall. Do not add annual ryegrass, Kentucky Bluegrass or perennial ryegrass as these species are very aggressive and they will inhibit the growth of the wetland seeds.

The wetland seed mix contains the following species: Fox Sedge (*Carex vulpinoidea*), Hop Sedge (*Carex lupulina*), Water Plantain (*Alisma plantago-aquatica*), Bearded Sedge (*Carex comosa*), Nodding Bur-marigold (*Bidens cernua*), Lurid Sedge (*Carex lurida*), Grass-leaved Goldenrod (*Solidago graminifolia*), Soft Rush (*Juncus effusus*), Blue Vervain (*Verbena hastata*), Hard-stem Bulrush (*Scirpus acutus*), Boneset (*Eupatorium perfoliatum*), Green Bulrush (*Scirpus atrovirens*), Flat-top Aster (*Aster umbellatus*), Woolgrass (*Scirpus cyperinus*), Sensitive Fern (*Onoclea sensibilis*), Spotted Joe-Pye Weed (*Eupatorium maculatum*), Soft Stem Bulrush (*Scirpus validus*), and Ditch Stonecrop (*Penthorum sedoides*).

Upland Seed Mix

The seed mix appropriate for transitional areas between the wetland and upland areas at the site is the "New England Roadside Matrix Upland Seed Mix." This seed mix contains a blend of native grasses, wildflowers and shrubs.

This seed mix should be applied at 1 pound per 1,245 square feet. The best results are obtained with a spring or summer seeding. Summer seeding can be successful with a light mulching of weed-free straw to conserve moisture. This mix is not well suited to late fall and winter dormant seeding.

This upland seed mix contains the following species of grasses, wildflowers and shrubs:

Grasses - Creeping Red Fescue (*Festuca rubra*), Switchgrass (*Panicum virgatum*), Little Bluestem (*Schizachyrium scoparius*), Indiangrass (*Sorghastrum nutans*), Big Bluestem (*Andropogon gerardii*), and Deertongue (*Panicum clandestinum*);

Wildflowers – Partridge Pea (*Chamaecrista fasciculata*), Wild Blue Lupine (*Lupinus perennis*), Showy Tick-Trefoil (*Desmodium canadense*), Silky Smooth Aster (*Aster laevis*), Wild Senna (*Cassia hebecarpa*), Butterfly Milkweed (*Asclepias tuberosa*), Round-headed Bush Clover (*Lespedeza capitata*), Early Goldenrod (*Solidago juncea*), and White Vervain (*Verbena urticifolia*); and

Shrubs – Gray Dogwood (*Cornus racemosa*) and Staghorn Sumac (*Rhus typhina*).

Temporary Seed Mix

This seed mix should be used when runoff events result in exposed soils adjacent to BMPs or resource areas, as well as for when road improvements are undertaken which disturb or add to the roadside slopes and soils. Annual Rye should be applied by a hand broadcast method at 1.4 pounds per 1,000 square feet.

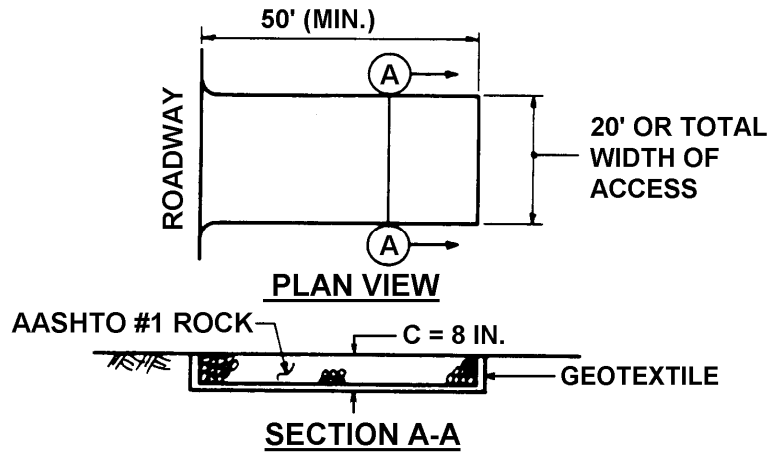
5.0 REFERENCES

1. MADEP, 2008 - Massachusetts Department of Environmental Protection. *Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas: A Guide for Planners, Designers and Municipal Officials*. February 2008. <[http:// www.mass.gov/dep/water/laws/policies.htm#storm](http://www.mass.gov/dep/water/laws/policies.htm#storm)>
2. MADEP, 1997 - Massachusetts Department of Environmental Protection and Massachusetts Office of Coastal Zone Management. *Stormwater Management Volume One: Stormwater Policy Handbook and Volume Two: Stormwater Technical Handbook*. March 1997. <[http:// www.mass.gov/dep/water/laws/policies.htm#storm](http://www.mass.gov/dep/water/laws/policies.htm#storm)>
3. PADEP, 2000 – Commonwealth of Pennsylvania Department of Environmental Protection, Office of Water Management. *Erosion and Sediment Pollution Control Program Manual*. March 2000. Document No. 363-2134-008.

Appendix A

BMP Construction Details

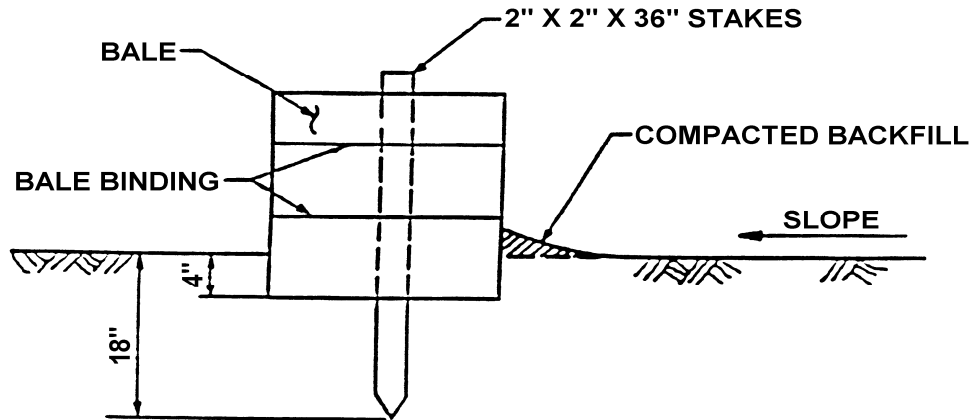
Rock Construction Entrance



MAINTENANCE: Rock Construction Entrance thickness shall be constantly maintained to the specified dimensions by adding rock. A stockpile shall be maintained on site for this purpose. At the end of each construction day, all sediment deposited on paved roadways shall be removed (swept) and returned to the construction site.

Straw Bale Barriers

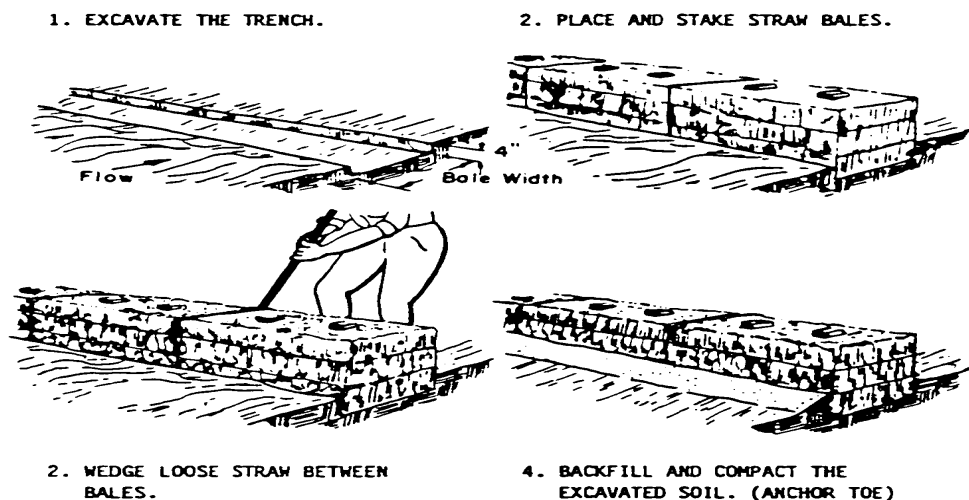
Straw bale barriers may be used to control runoff from small disturbed areas provided that runoff is in the form of sheet flow. Since straw bales tend to deteriorate within a 3-month period, they should be considered as short-term control measures.



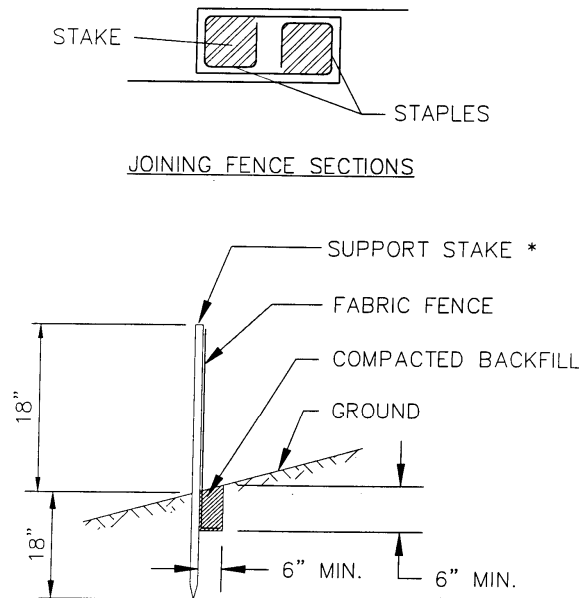
Straw bale barriers should not be used in areas where rock prevents full and uniform anchoring of the bales. Straw bale barriers should be installed according to the above diagram.

Bales should be installed in an anchoring trench. Two support stakes should be driven through each bale to the depth 18" (if possible) below the ground surface. The excavated soil should be backfilled and compacted on the upslope side of the bales. Straw Bale Barriers shall be placed at existing level grade. Both ends of the barrier shall be extended at least 8 feet up slope at 45 degrees to the main barrier alignment.

MAINTENANCE: Sediment shall be removed when accumulations reach 1/3 the above ground height of the barrier and any section of Straw Bale Barrier, which has been undermined or topped, shall be immediately replaced. Straw bale barriers used in areas of concentrated flows (e.g. channels, swales, erosion gullies, across pipe outfalls, as inlet protection, etc.) shall be inspected daily for breaches.



Standard Filter Fabric Fence (18" High)



Filter Fabric Fence must be placed at level existing grade. Both ends of the barrier must be extended at least 8 feet up slope at 45 degrees to the main barrier alignment. Filter fabric fence alignment should be at least 8' from the toe of fill slopes.

Filter fabric fence may be used to control runoff from small disturbed areas when it is in the form of sheet flow, and the discharge is to a stable area. Only those fabric types specified for such use by the manufacturer should be used. Do not use filter fabric fence in areas of concentrated flows (e.g. channels, swales, erosion gullies, across pipe outfalls, as inlet protection, etc.). Filter fabric fence should not be used in areas where rock or rocky soils prevent the full and uniform anchoring of the fence. Filter fabric fence should not be installed on un-compacted fills or in extremely loose soils (e.g. sandy loam), since this will likely result in undermining of the fence.

Filter fabric fence should be installed at level grade. Both ends of each fence section should be extended at least 8 feet upslope at 45 degrees to the main fence alignment to allow for pooling of water.

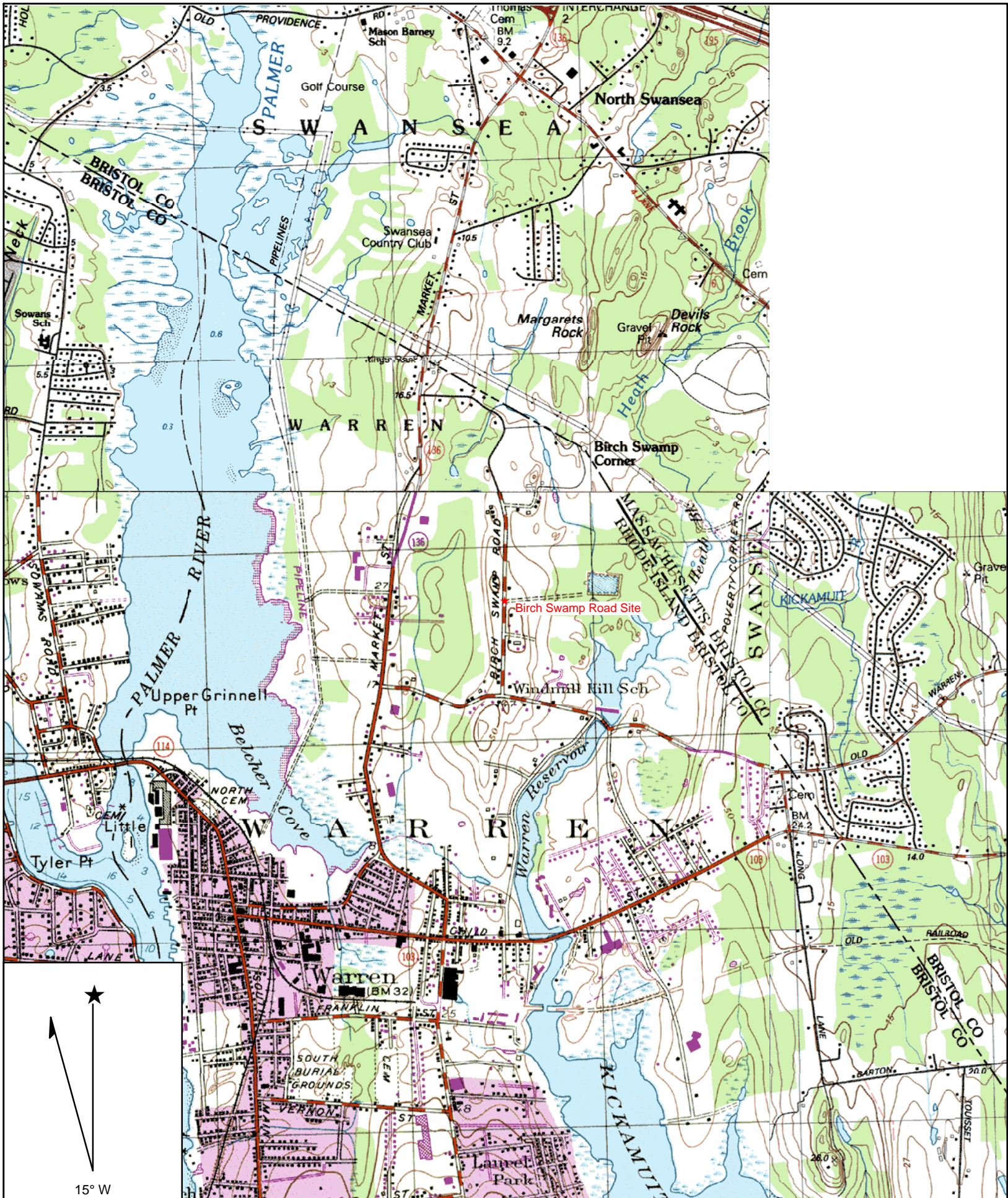
A 6" deep trench should be excavated, minimizing the disturbance on the downslope side. The bottom of the trench should be at level grade, maximum deviation from level grade should be 1%, and not extend for more than 25 ft. Placing the fabric "tail" in the bottom of the trench, and backfilling and compacting the fill material in the trench should anchor the bottom of the fence.

Support stakes should be driven 18" below the existing ground surface at 8-foot (max.) intervals (or manufacturers specifications). At fabric ends, both ends should be wrapped around the support stake and stapled. If the fabric comes already attached to the stakes, the end stakes should be held together while the fabric is wrapped around the stakes at least one revolution prior to driving the stakes.

Maintenance: should be inspected as specified in the BMP Inspection section. Needed repairs should be initiated immediately after the inspection. Sediment must be removed when accumulations reach 1/2 the above ground height of the fence. Any section of Filter fabric fence that has been undermined or topped must be immediately replaced with a Rock Filter Outlet.

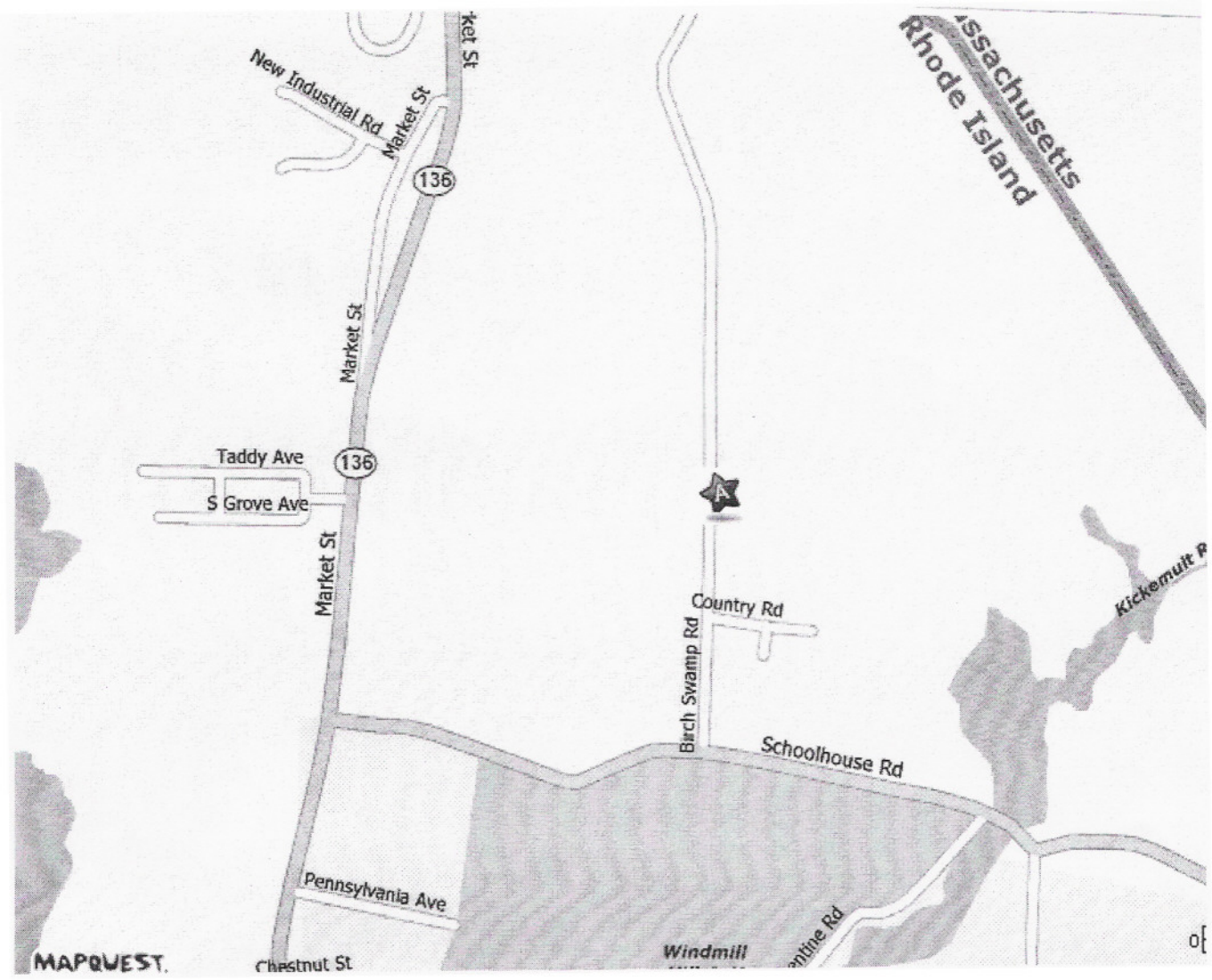
Appendix B

Plan Figures



Name: BRISTOL
 Date: 9/5/2008
 Scale: 1 inch equals 2000 feet

Location: 041° 44' 41.49" N 071° 15' 58.79" W
 Caption: Birch Swamp Road Site
 Warren, Rhode Island



New Industrial Rd
Market St
136

Taddy Ave
S Grove Ave
136

Market St

Pennsylvania Ave

Chestnut St

Country Rd

Birch Swamp Rd

Schoolhouse Rd

Windmill

entine Rd

Massachusetts
Rhode Island

Kickemuit Pt

MAPQUEST.

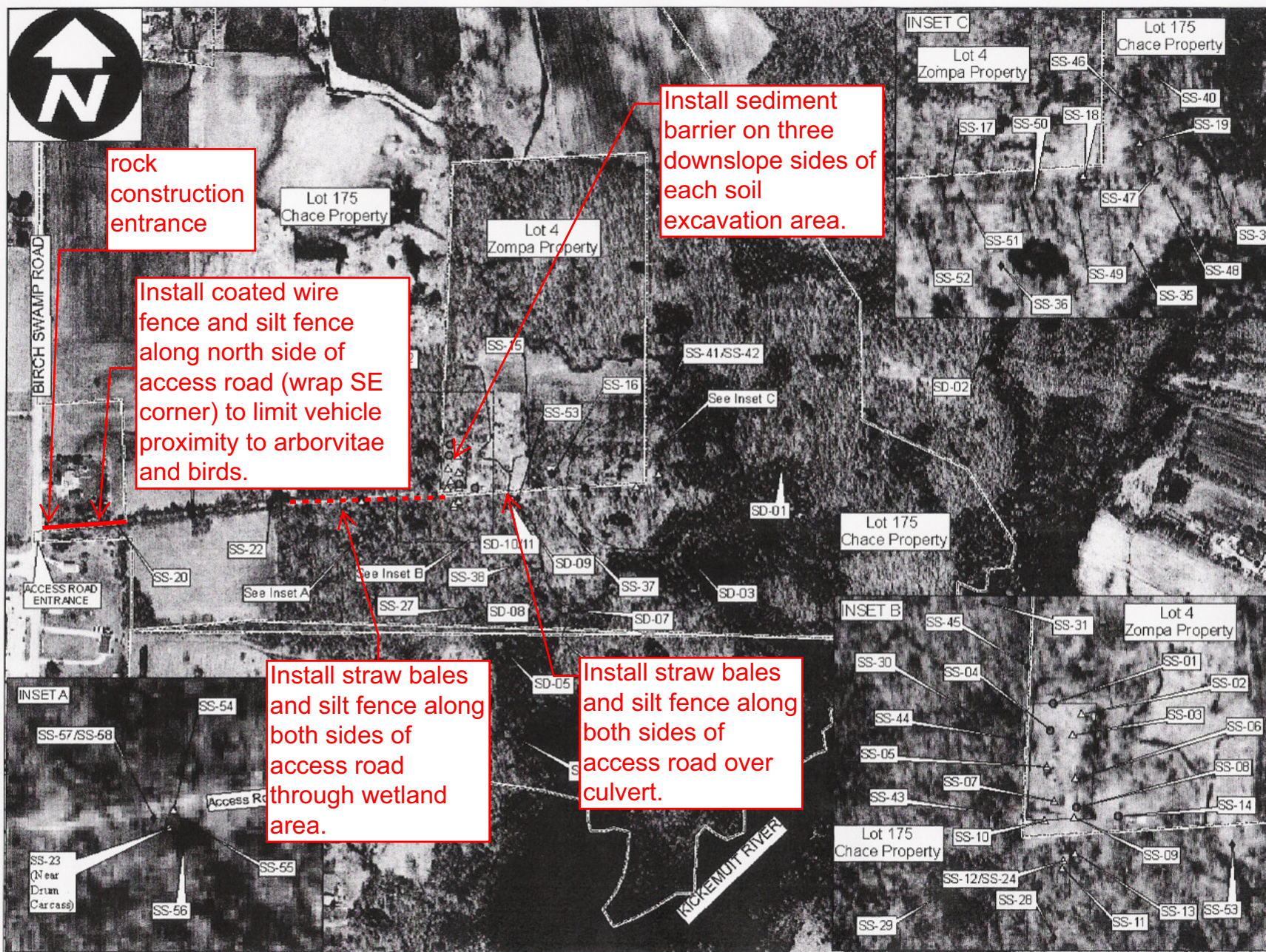


FIGURE 3

SAMPLE LOCATION MAP

Birch Swamp Road
Birch Swamp Road
Warren, Rhode Island

EPA Region I
Superfund Technical Assessment and
Response Team (START) III
Contract No. EP-W05-0-02

TDD Number: 08-03-0003
Created by: B. Mace
Created on: 15 August 2007
Modified by: B. Mace
Modified on: 15 July 2008

LEGEND

- Lot Boundaries
- Former Foundation
- Streams
- 2007 Soil Samples
- ◆ 2008 Soil Samples
- △ 2007/2008 Lead >150 ppm
- 2007 Lead >150 & PCB >10 ppm
- 2007 Sediment Samples
- 2008 Sediment Samples
- > Greater than
- PCB Polychlorinated bipheyls
- ppm parts per million

0 250 500
Feet

Data Sources
Imagery: Rhode Island Geographic Information
System (RIGIS), MainstreetGIS, LLC.
Epos: MicroPath
All other data: START, EPA Office of
Environmental Measurement and Evaluation
(OEME).

WESTON
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