



pennsylvania

DEPARTMENT OF TRANSPORTATION

Strategic Recycling Program

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**AN OVERVIEW FOR SOLID WASTE AND
RECYCLING FUND ADVISORY COMMITTEES**

BACKGROUND

Act 101: The Municipal Waste Planning, Recycling, and Waste Reduction Act of 1988; reauthorized as Act 175 in December 2002; as Act 140 in November 2006; and, as Act 24 in 2010.

Relevant Act 101 Citations:

- Section 706 – directs PA DEP to provide funding to various parties for recycling projects.
- Section 1506 – directs PennDOT to evaluate products and materials that may be recycled in transportation and civil engineering applications.



PENNDOT AND PADEP MEMORANDUM OF UNDERSTANDING (MOU)

- 1) Establishing and implementing a waste reduction program for materials used in PENNDOT operations;
- 2) Continually reviewing and revising existing procedures and specifications;
- 3) Evaluating materials that may be recycled in transportation and civil engineering applications;
- 4) Employs procurement and contract bidding options encouraging recycled materials use.



PENNDOT'S STRATEGIC RECYCLING PROGRAM (SRP)

PennDOT SRP Development:

Created in 1998 as a tool to systematically identify, evaluate, and implement recycling opportunities throughout Pennsylvania.

PennDOT SRP Objectives:

- 1)** Realize economic savings and environmental enhancement to PENNDOT and the Commonwealth;
- 2)** Continued development and improvement to pollution prevention, recycling, energy efficiency efforts; and
- 3)** Sound environmental management practices.



SYSTEMATIC APPROACH TO RECYCLE MATERIALS

Factors that are critical to the success of this program are:

- ✓ Use of recycled materials should be cost competitive;
- ✓ Recycled materials should perform as well as conventional materials;
- ✓ There must be product consistency and quality control;
- ✓ Communications.



STRATEGIC RECYCLING PROGRAM

FIVE KEY FOCUS AREAS

Research – To collect information on recycled materials and to identify and resolve data gaps associated with the use of recycled materials.

Specifications – To develop, obtain, and/or disseminate user guidelines, provisional special provisions and Publication 408 specifications at the Municipal, District and Statewide levels.

Projects – The overall objective is to successfully incorporate recycled materials in transportation-related projects, including post-construction monitoring.

Outreach – To disseminate the results and experiences of recycled materials projects to PENNDOT, Commonwealth agencies and the public.

Contracting – To provide technical assistance to the Engineering Districts in developing construction contract mechanisms to specify or provide for recycled material use.

CURRENT RECYCLE MATERIAL SPECIFICATIONS

Aluminum – road, highway, and recycling center signs;

Asphalt Shingles – Over-cuts, tabs, and post-consumer shingles as ingredients in Hot Mix Asphalt; **(SRP)**

Blast Furnace Slag – anti-skid material and fine or coarse aggregate;

Crushed Glass – embankment fill - Sound Wall/Jersey barrier, aggregate base course base drains/reinforced concrete pipe bedding/storm sewer/u-drains; **(SRP)**

Bottom Ash – anti-skid material;

Compost – Soil Amendments, Mulching, Compost FilterSock, Compost Blanket and Compost Filter Berm. **(SRP)**

Fly Ash – cement concrete, flowable fill, concrete pozzolan;

CURRENT SPECIFICATIONS (CONTINUED)

Recycled Asphalt Pavement (RAP) – sub-grade, and sub-base material and roadway shoulders – currently governed under a PA DEP Co-product Determination or General Permit);

Reclaimed Portland Cement Concrete (RPCC) – as aggregate, road sub-base, rip-rap, gabions, concrete pavement, and miscellaneous drainage; **(SRP)**

Scrap Tires – Tire Shreds as Structural Fill (TDA), Crumb Rubber with Stone Mix Asphalt (SMA) DRY or WET Method, Crumb Rubber as a Stabilizer, Crumb rubber for Absorptive Noise Barriers, Tire chips filler for Carsonite Sound Walls (plastic wall modules containing recyclable tire rubber). **(SRP)**

Steel Slag – fine or coarse aggregate, sub-base, select granular material, select materials surfacing, shoulders, and bituminous surface courses, blending with RAP materials; **(SRP)**

Spent Foundry Sand – fine aggregate, flowable fill; **(SRP)**



SMA CRUMB RUBBER PROJECT JULY 2011



Utilized Crumb Rubber Modified Asphalt (CRMA) at District 9-0 Nicktown Stockpile staging area

- Minimize stormwater runoff from leaving the site;
- Direct stormwater to the existing detention system;
- Evaluate performance of CRMA in an area which see use of heavy equipment in a confined area.



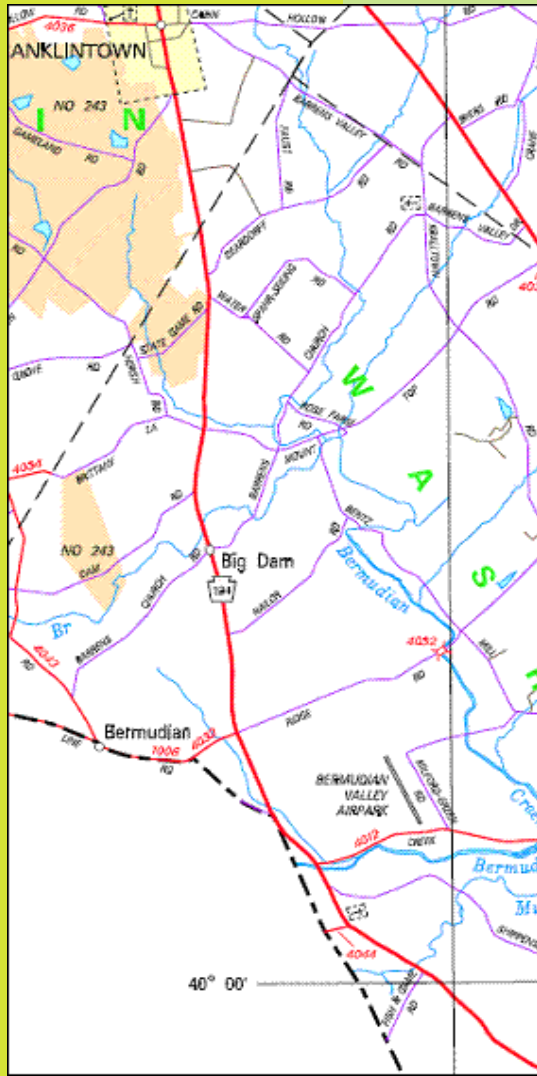
GLASS CULLET PROJECTS – LACKAWANNA CO.

Lackawanna County – District 4-0 at SR 6 and 247

- Provisional Specification for Glass Cullet as backfill, meeting Pub. 408, Section 703, AASHTO No. 8 gradation requirements; Table B, Type C quality requirements (expect allowance of 100% glassy particles).
- Pipe trenches bedded with crushed glass aggregate;
- Four feet of glass aggregate capped with 12-inch layer of natural aggregate;
- Four-year inspection/evaluations performed;



RUBBERIZED ASPHALT SEAL COAT PROJECT



Site Location: York County, SR 0194 - Adams County

Date of Project: September 2007

Estimated Quantities: 18% +/- 3% Rubberized Asphalt Seal Coat (RASC)

Distance: 10.1 Miles Width 32 feet. ADT roadway (1,500 to 12,000 vehicles per day)

Actual Amount: RASC blend 22% crumb rubber and asphalt cement; approximately 17,550 Tires



Recycled Rubber Sound Walls

Carsonite Sound Wall

Lightweight hollow panel noise barriers made of reinforced composite material filled with recycled crumbed tire rubber.



Absorptive Noise Barrier

Rubber tires are recycled and processed into small chips, the rubber chips are then blended with natural sound absorbing aggregate and cement to produce a sound absorbing mixture.



TIRE SHREDS – LIGHTWEIGHT FILL



Tarrtown Bridge - Armstrong County SR 4023, Section 150

- ❑ First scrap tire recycling project in PA;
- ❑ 750,000 tires (7,500 tons) used Scrap tires from 4 community collection days, river sweeps, 6 abandoned tire piles, and PADEP Clean-ups;
- ❑ Shredded tires used as lightweight geotechnical fill (50lb/ft³);
- ❑ Joint funding provided by PADEP



RECENT SRP PROJECTS



- ❑ **Admiral Peary Vo-Tech School Project (Cambria County, District 9-0):** Use of Compost Filter Socks for Wetland Mitigation) (to be completed by early to mid-August 2011). **SRP Monies: \$4,500.00.**

- ❑ **Bull Creek Box Culvert/Bridge Project (Allegheny County, District 11-0):** Use of Compost Filter Socks for Erosion Control (to be completed by July 2011). **SRP Monies: \$1,800.00.**



- ❑ **Picnic Tables (Various Roadside Rest Areas, District 1-0):** Using plastic picnic tables to replace wooden picnic tables – this occurred on two occasions (completed in June 2010 and June 2011). **SRP Monies: \$20,000.00 (2010) and \$14,000.00 (2011).**



- ❑ **I-99 Roadside Project (Blair County, District 9-0):** Use of Rubber Mulch Mats to Reduce Erosion and Burn-Out Sequences from Herbicide Spraying (completed in June 2011). **SRP Monies: \$5,000.00.**

CURRENT SRP PROJECTS FY 2012

- ⊙ Milled Asphalt/Aggregate Substitute – Paving Material (District 1-0) – **Completed June 2012**
- ⊙ Reclaimed Portland Cement Concrete – Aggregate Substitute (District 1-0) – **Continuing**
- ⊙ Compost – soil stabilization (District 5-0, Route 222, Berks County) – **September 2012**
- ⊙ Crumb Rubber – Gap Grade Application (District 5-0, Interstate 78, Berks County) – **Sept thru Oct 2012**
- ⊙ Rubber Mulch (District 9-0 Office - Landscaping) – **Continuing**
- ⊙ Rubber Mulch Mats (District 9-0: I-99 Corridor, Round II)- **Continuing**

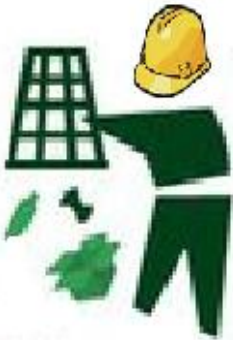
PROJECT OPPORTUNITIES

Potential Materials

- ❑ Compost – E&S Controls
- ❑ Rubber Absorptive Barrier Sound Walls
- ❑ Reclaimed Portland Cement Concrete (RPCC) – Misc Drainage, Gabions and Rip-rap
- ❑ Crushed Glass – Embankment Material
- ❑ Crumb Rubber –SMA –HMA Mix (Gap Grade)
- ❑ Tire Derived Aggregate (TDA) - Embankment Material
- ❑ Spent Foundry Sand – Aggregate and Flowable Fill

PENNDOT'S WASTE AUDIT PROGRAM

- ⊙ PennDOT waste audits are conducted Biannually and serve to:
 - ⊙ collect solid waste and recyclable generation and cost data;
 - ⊙ measuring progress of PennDOT District and Central Office solid waste management activities;
 - ⊙ provide a large picture of where PennDOT stands with its overall office waste management practices;
 - ⊙ allows each District to benchmark their current recycling programs and enable District Offices to determine areas that can be improved upon;
 - ⊙ increase employees' awareness to recycling methods;
 - ⊙ overall costs for waste disposal and recyclable management;





THANK YOU

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