

Concrete & Asphalt Recycling at Sandia National Laboratories/New Mexico

OFEE Symposium

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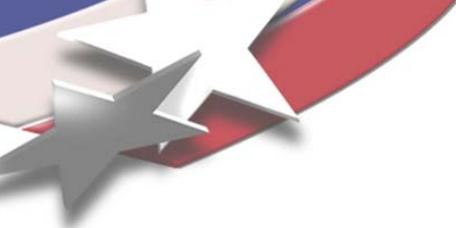
SNL/NM Pollution Prevention



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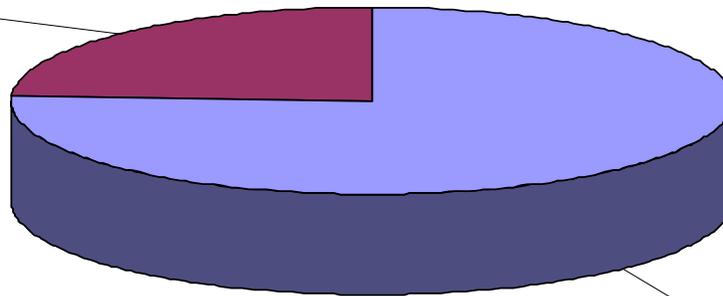
Presentation Overview

- **Motivation Behind Concrete/Asphalt Recycling**
- **Concrete & Asphalt Recycling Background**
- **Current Recycling Process**
- **Applications for Recycled Concrete & Asphalt**
- **Cost Issues**
- **FY07 Results and Looking Ahead**
- **Questions**

Why Recycle Concrete & Asphalt

**Concrete was 76% of the Waste Sandia Sent to Landfills in FY05
(in tons and percent of total)**

Solid Waste That is Not Concrete = 5,544 tons or 24%



Concrete Portion of Solid Waste = 17,508 tons or 76%



Concrete & Asphalt Generation

Primary Sources of Concrete:

- Building Demolition Material
- Curb & Gutter
- Walkways
- New Building Construction (washout)

Primary Sources of Asphalt:

- Roadway Resurfacing/Reconstruction
- Parking Lot Resurfacing/Reconstruction

LEED Green Building Projects

Sandia, New Mexico, has 5 LEED Certified Buildings

- CINT
- JCEL
- MFAB
- MLAB
- WIF





Background

- Concrete Recycling Pilot Demonstration
- KAFB Landfill Accumulation (Supported SNL/NM LEED Projects)
- Initial Crushing Events at KAFB Landfill
- Unreliability at KAFB Resulted in Need for Permanent Recycling Area
- “Search” for Acceptable Location
- Planning (NEPA, SWPPP, Maintenance, etc.)
- Operations (FOP, Generator Contract Requirements, Crushing Contract, Signage, Promotion, Awareness & Outreach)

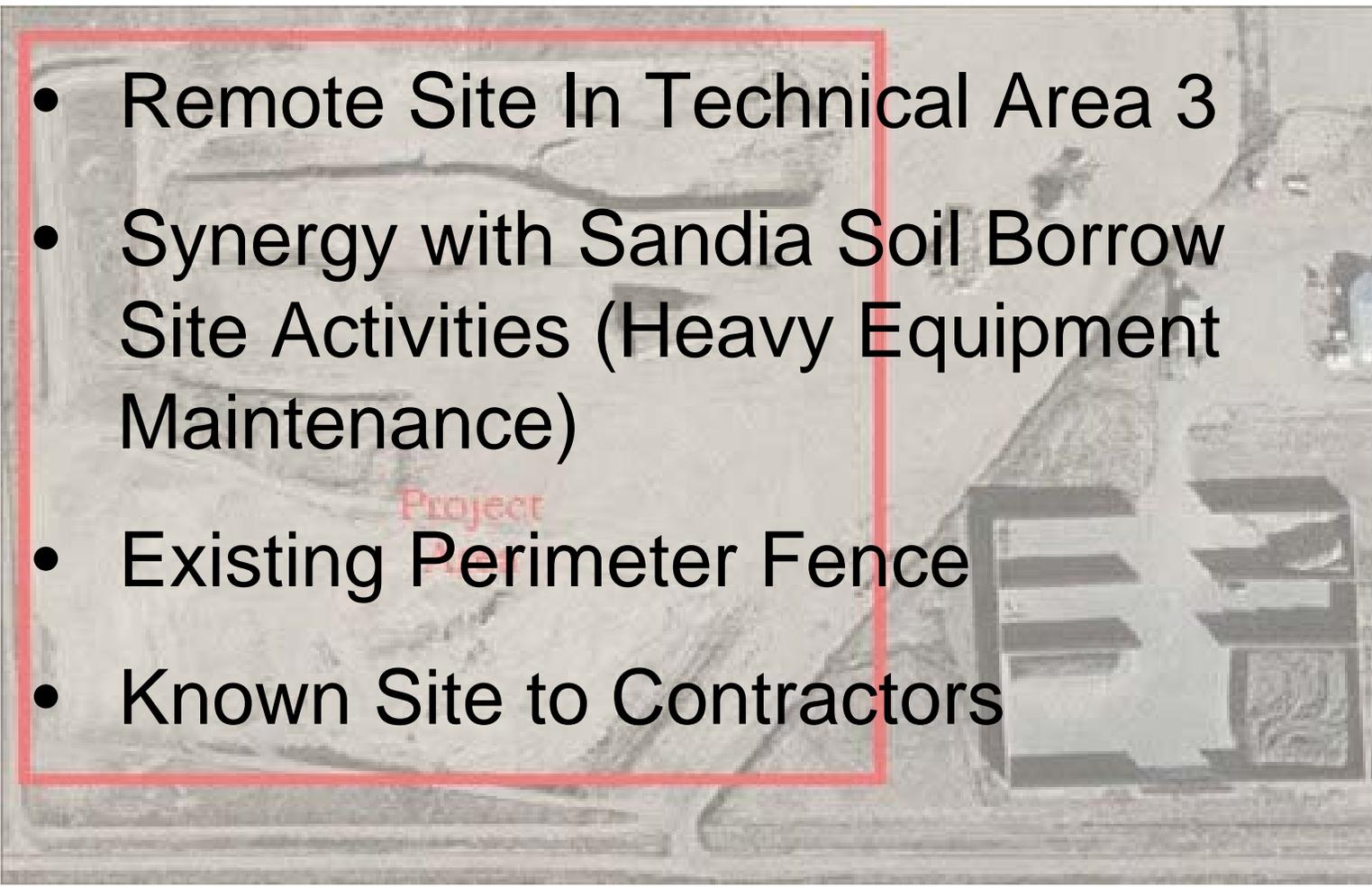


Current Concrete/Asphalt Recycling Process

- Contractors Deliver Concrete/Asphalt Debris to the Concrete & Asphalt Recycling Area (CARA)
- Upon Accumulation of a Sufficient Quantity of Material, a Crushing Event is Conducted
- Crushed Material is then Stockpiled for Use
- P2 Works with Facilities and Project Managers to Obtain Commitments to Use Crushed Materials



CARA Location

- 
- Remote Site In Technical Area 3
 - Synergy with Sandia Soil Borrow Site Activities (Heavy Equipment Maintenance)
 - Existing Perimeter Fence
 - Known Site to Contractors

CARA – Dedicated Stockpile Areas



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CARA Entrance Signage

- Unattended Operation
- Contamination Reminder
- Contact Information



CARA Stockpile Signage

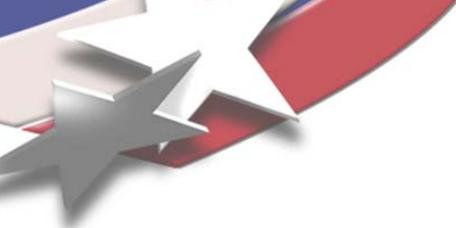


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Crushing Requirements

- Crushed Concrete/Asphalt Base Course Meets City Of Albuquerque Specification, Section 302 Aggregate Base Course Construction
- Crushed Asphalt as Surface Cover Meets City Of Albuquerque Specification, Section 308, Natural Gravel Surfacing for Unpaved Roadways
- Other Aggregates are Size/Gradation Specific



Crushing Operations



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Finished CCBC



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Crushed Asphalt



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Applications

Crushed Asphalt used as a Surface Cover for the Grounds and Roads Services Equipment Yard



CCBC used in construction of the MESA WIF Entrance Road

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Applications

**Crushed Asphalt Use
In Science Project:**
Porous Rock Bed to act
as a Thermal Storage
Floor in a 50ft x 100 ft
Greenhouse



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Other Potential Applications

Other Applications being Explored

- 2"-3" Concrete Aggregate for Track- Off Pads (Specifically for Soil Borrow Site and CARA)
- Crushed Asphalt Cover on SNL/NM Remote Dirt Roads for Dust Control
- Pipe Drainage Stone



Crushing Cost Issues

- Concrete & Asphalt Recycling Program Costs Based on Reimbursement
- Initial “Seed” Money for 1st Crushing Event Provided by Recycling Revenues (Paper, Cardboard, Metal)
- Aggregate Users Pay for Material Based on \$/ton Crushing Costs



Cost Comparison to Commercial Vendors

Recycled Concrete Base Course Cost Includes:

- Equipment Mobilization
- Crushing
- Testing

Resulting Cost is
\$9.40 per Ton



Local Vendor Cost for ABC same as CCBC -
\$15.45 per Ton

Cost Savings Example

FY08 G&H Avenue Repaving Project

- Base Course Needs ~ 5,500 tons
- Estimated Cost Savings ~\$5 per ton,
(Including Transportation/Delivery)
- Total Project Cost Savings
~ **\$27,500**



Additional Cost Considerations

- Cost Sharing with Soil Borrow Site Maintenance Activities (Pile Management)
- SWPPP Maintenance - Track-Off Pads at Entrance of CARA and Soil Borrow Site Replaced Annually





FY07 Results & Ongoing Activities

Diversion from the Landfill

- ~ 6,000 tons Crushed Concrete Base Coarse
- ~ 2,000 tons Crushed Asphalt

Constantly Promoting

- Contractor Delivery To the CARA
- ******Controlling Contamination******
- Project Partnerships to Use Recycled Concrete & Asphalt Aggregates
- New Applications



Contamination Issues

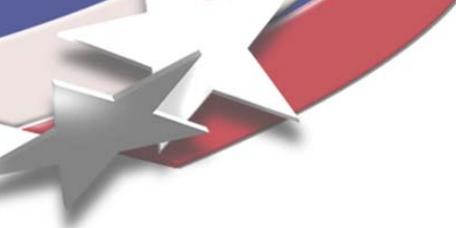


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Looking Ahead FY09/10 Plans

- Facilities Request for 1,000 tons of Crushed Asphalt for General Use
- Partnership with PMs on I, 7th, 8th, and P Avenue Repaving Projects for Use of Approximately 3,000 yards of CCBC
- Working with Facilities on 1-Mile Test Stretch of Remote Dirt Road to be Surfaced with Crushed Asphalt for Fugitive Dust Control



Questions?

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