



NASA GLENN RESEARCH CENTER
at
LEWIS FIELD

**SAFETY, HEALTH & ENVIRONMENT DIVISION,
ENVIRONMENTAL MANAGEMENT BRANCH**

Michael Bajorek & Michael Hovanic
Waste Management Program
March 2007



**MANAGEMENT OF:
CONSTRUCTION & DEMOLITION DEBRIS,
CLEAN HARD FILL,
AND COMMERCIAL/INDUSTRIAL FILL**



ENVIRONMENTAL MANAGEMENT SYSTEM, (EMS)

- ENVIRONMENTAL POLICY
 - NASA Glenn Research Center operates in a manner that preserves and the protects the environment through pollution prevention, the continual improvement of our operations, and complying with regulations.



Objectives and Targets Plan for NASA Glenn Research Center FY 2007

- Objective
 - Reduce solid waste generation
- Target
 - Achieve a goal of recycling 5% of total construction & demolition debris generated at the Center. The following specific materials will be tracked:
 - Asphalt, Concrete, Gravel/Stone,
 - Commercial/Industrial Fill Soil,
 - Topsoil, Trees/Bushes,
 - Ferrous and Non-Ferrous Metals,
 - Concrete Block, Bricks,
 - Carpeting,
 - Cardboard,
 - Ceramic Tile



Objectives and Targets Plan for NASA Glenn Research Center FY 2007, conti.

- Responsible party, code; Programs
 - Gene Stygles, DFO
 - GRC Spec Intact
 - Mike Bajorek, QSEO
 - Monitor conformance with related EPM chapters and report progress on target
- Date Due:
 - 9/30/2007
 - Tracked quarterly
- Performance indicators & metric
 - Number of pounds of recycled material as a percent of total construction & demolition debris generated



Waste Management Program (WMP)

- The Mission of the Program is to provide for the management of solid and non-solid wastes as defined by Federal and State Environmental regulations and laws. The management of wastes includes, but is not limited to, reuse, recycle or proper disposal.



WMP Support

- Proper characterization and tracking of all offsite shipments of:
 - Solid wastes;
 - Hazardous wastes (used oils, fuels, laboratory chemicals);
 - Soils to be used for commercial and/or industrial fill;
 - Construction and demolition debris;
 - Recyclables;
 - Manifest development, review and tracking.



WMP Support (conti.)

- Support services:
 - Resource Conservation and Recovery Act Training;
 - Remedial services for the cleanup and decontamination of spilled or released hazardous and non-hazardous materials;
 - Collection, tracking and management of hazardous and non-hazardous materials for reuse, recycling and/or disposal.
 - Site investigations
 - Environmental Sampling
 - Geotechnical Sampling



WMP Non-Solid Waste Management

- Non-solid waste
 - Construction and demolition debris
 - Those materials resulting from the alteration, construction, destruction, rehabilitation, or repair of any manmade physical structure,
 - brick, concrete and other masonry materials, stone, glass, wall coverings, plaster, drywall, framing and finishing lumber, roofing materials, plumbing fixtures, heating equipment, electrical wiring and components c
 - containing no hazardous fluids or refrigerants, insulation, affixed carpeting, asphalt substances, metals incidental to any of the above, and weathered railroad ties and utility poles.
 - do not include materials whose removal has been required prior to demolition, and materials which are otherwise contained within or exist outside the structure such as solid wastes, yard wastes, furniture, and appliances. Also excluded in all cases are liquids including containerized or bulk liquids, fuel tanks, drums and other closed or filled containers, tires, and batteries.



Non-Solid Waste Management (conti.)

- Clean, hard fill
 - consists only of reinforced or non-reinforced concrete, asphalt concrete, brick, block, tile, and/or stone which can be reutilized as construction material. Brick in clean hard fill includes but is not limited to refractory brick and mortar. Clean hard fill does not include materials contaminated with solid wastes, hazardous wastes, or infectious wastes.



Non-Solid Waste Management (conti.)

- Commercial/industrial fill soil
 - Commercial Land
 - Commercial land is land with potential exposure to adult workers during a business day and potential exposures of adults and children who are customers, patrons or visitors to such facilities. Examples of commercial land include, but are not limited to: building supply facilities; office buildings; hotels; and parking facilities.
 - Industrial Land
 - Industrial land is land with exposure of adult workers during the business day. Industrial land use must reliably exclude the general public and children from access to the facility. Examples of industrial land include, but not limited to: power plants; manufacturing facilities; chemical plants; non-public airport areas; and limited access highways.



Non-Solid Waste Management (conti.)

- Recyclable Materials
 - Metal
 - No peeling or flaking lead based paint
 - Concrete
 - Asphalt
 - Non-treated wood and landscape debris
 - cardboard



Documentation

Documentation

- Health and Safety Plan (HaSP)
 - Administered by Glenn Safety Branch
 - Includes a Waste Management Plan
 - What waste is being generated
 - Waste Characterization Profile
 - How much waste is being generated
 - How will it be managed onsite
 - How will it managed offsite



Documentation (conti.)

Steps to a shipping document

- Waste Characterization Profile review
 - Analytical data
 - Generator knowledge
 - Soil determination
 - WMP Review
 - EMB Signature
 - Disposal site acceptance
- Draft shipping document review
 - WMP review of transporter
 - Assign document number
 - EMB Signature



Documentation- Shipping Papers

- NASA GRC Non-Solid Waste Form
 - Used to track offsite shipments of non-solid waste

NON-SOLID WASTE MANIFEST		Manifest Document number: _____
Material will be handled as (choose one): <input type="checkbox"/> Clean Fill <input type="checkbox"/> Clean Hard Fill <input type="checkbox"/> Construction/Demolition Debris		
<input type="checkbox"/> Other (please describe): _____		
Material shipped as Clean Fill will be used for: <input type="checkbox"/> Commercial Land Use <input type="checkbox"/> Industrial Land Use		
RECIPIENT SITE LOCATION: _____		
GRC SITE LOCATION (Also Circle location on pg.2 site map): _____		
PROJECT: _____		CONTRACT NO: _____
RESPONSIBLE CONTRACTOR: (please print name and title) _____		
<small>CERTIFICATION & ACCEPTANCE: The undersigned hereby certifies that he/she is authorized to accept responsibility for the non-waste material on behalf of the named Contractor. Contractor agrees to use this non-waste material as fill material at the commercial or industrial location identified below. The undersigned hereby certifies on behalf of the responsible contractor that the identified location is solely commercial or industrial and not residential and that all materials contained in this manifest will be handled and dispositioned in accordance with all applicable laws and regulations (e.g. Storm Water Pollution Prevention, Air Nuisance, etc.)</small>		
SIGNATURE: _____		DATE: _____
MATERIAL GENERATOR:	NASA Glenn Research Center, Waste Management Team, Mail stop 6-4 21000 Brookpark Road, Cleveland, Ohio 44135 Telephone: 216.433.2124 Fax: 216.433.2014	
<small>GENERATOR CERTIFICATION: On behalf of NASA Glenn Research Center, we hereby certify that: NASA has completed and has on file a Soil Determination Checklist for the above named material; that the material is not a solid waste; and that the material qualifies as Clean Fill, Clean Hard Fill as defined in OAC 3745-400-01, or as Construction/Demolition Debris as defined in OAC 3745-400-01. Clean Fill guidelines are applied in accordance with the Ohio Voluntary Action Program Standards for Commercial Land Use Categories or Industrial Land Use Categories (OAC 3745-300.) Note that this soil fails the Ohio VAP Standards for Residential Fill, and therefore shall not be used at a Residential Fill site and no placement of the soil into a waterway will be permitted.</small>		
NASA REPRESENTATIVE FOR PROJECT: (please print name and title) _____		
SIGNATURE: _____		DATE: _____
OHIO EPA REVIEW: <small>The OEPA has been offered an opportunity to review, and either concurs or has no objection.</small> <input type="checkbox"/> Non-applicable <input type="checkbox"/>		
NASA EMO/Environmental Compliance Team: (please print name and title) _____		
SIGNATURE: _____		DATE: _____
TRANSPORTER COMPANY: _____		TRANSPORTER TELEPHONE: _____
CONTAINER TYPE: _____		CONTAINER VOLUME: _____
CONTAINER EMPTY WEIGHT: _____		LOADED CONTAINER WEIGHT: _____
QUANTITY OF CONTAINERS: _____		
DRIVER NAME: (please print name) _____		
DRIVER SIGNATURE: _____		DATE: _____
<small>RECIPIENT CERTIFICATION: The undersigned either owns or is authorized to represent the owner of the property identified herein as the Recipient Site Location. It is understood that the non-waste manifest is restricted for use at commercial or industrial sites only. The Recipient certifies that the real property identified as the Recipient Site Location is restricted to commercial and/or industrial use and that no residential use will be permitted and no placement of the soil into a waterway will be permitted.</small>		
RECIPIENT FACILITY REPRESENTATIVE NAME: (please print name and title) _____		
RECIPIENT FACILITY REPRESENTATIVE SIGNATURE: _____		DATE: _____
<small>NASA Non-Solid Waste Manifest (02/03) (use for Commercial Fill soil, Clean Hard Fill or Construction/Demolition Debris) RETURN COMPLETED DOCUMENT TO Material Generator as listed above</small>		



FY Totals

Item	FY2005	FY2006	FY2007**
Asphalt	1,657,250 P*, 947 Y	11,928,620 P, 40 Y	5,000,390 P
Concrete	2,223,350 P* 1,668 Y	6,216,870 P	3,058,760 P, 10Y
Gravel/stone	8,900 P*, 10 Y	532,080 P	1,034,810 P
Com/Ind fill	2,113,615 P*, 1208 Y	19,799,425 P, 70 Y	38,875,010 P
Topsoil	0	0	0
Trees/bushes/wood	56,600 P	91,390 P,	6,060 P
Ferrous/nonferrous metals	153,850 P*, 400 Y	174,256 P	102,990 P
Concrete block/bricks	0	0	0
Carpeting	0	0	0
Ceramic tile	0	0	0
Construction & Demolition Debris (to C&DD landfill)	217,800 P, 530 Y	560,880 P	487,480 P, 160 Y
Solid Waste (to sanitary landfill)	3,642,320 P	779,120 P, 50 Y	50,800 P, 200 Y

***Estimated Quantities**

****Through 1/31/07**

FY05 Most trucks were shipped in cubic yards (Y) and P* represents estimated quantities.

FY06 Weights were obtained for the majority of loads, some materials were shipped in yards (possibly do to the scales not functioning or drivers not weighing out)

Roll Off Pictures.....



Debris sent to CD & D Landfill...



Concrete Washout...





WMP “Roll Off” Study

Project	Size	Wood	Metal	Plastic	Card-board	Fill	C&DD	Trash	Other	Total
Sub K	20y	2700	800	300	200	0	860	2720	560	8140
B.64	20y	400	2360	0	138	0	1983	739	0	5620
B.109	30y	1440	750	0	219	1260	5430	1401	0	10500
Various	20y	1254	986	177	210	0	2481	843	700	6651
		5794	4896	477	767	1260	10754	5703	1260	30911

Roll Off “Inventory”



Roll Off “Inventory”





WMP Recycling Efforts

	FY04	FY05	FY06	FY07
Used oil	136,340 p	30,740 p	55,860 p	0 p
Waste water	74,260 p	99,740 p	280,780 p	18,540 p
Spent oil filters	1,779 p	542 p	363 p	0 p
Spent solvents	9,279 p	5,687 p	6,377 p	3,127 p
Fuel	4,910 p	16,970 p	27,689 p	418 p
Universal waste, lamps	11,741 ea	5,037 ea	4,464 ea	6,716 ea
Universal waste, batteries	6,225 p	2,455 p	2,795 p	8,274 p
Refrigerant	1,554 p	0 p	0 p	15 p