



Kennedy Space Center
Center Operations Directorate

Medical & Environmental Management Division

KSC Environmental Working Group

August 4, 2006



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Overview from NASA Environmental Workshop June 5-8, 2006 Portland, OR

Diane Callier, NASA

TA-C3



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Overview of NASA 2006 Environmental Workshop

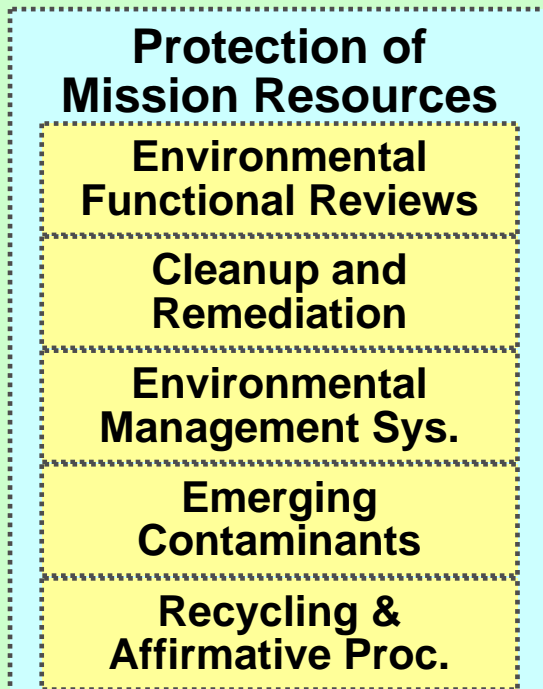
Medical & Environmental Management Division

- ◆ Environmental Management Panel
 - NASA HQ Environmental Management Division
 - Risk Communication & Management
 - Changes in Environmental Functional Reviews
 - Recycling & Affirmative Procurement
 - Energy Policy Act of 2005
-



Overview from 2006 NASA Environmental Workshop

Environmental Management Division





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What is Risk Management?

- ◆ In simplest terms, **Risk Management** is an organized process to uncover risks, their likelihood and severity, and deal with them before they become problems.
 - ◆ The purpose of **Risk Management** is to make informed decisions.
 - ◆ Within **Risk Management**, we identify, analyze, plan, track, control, and communicate risks to achieving our goals and objectives.
 - ◆ **Risk Management** does not change what we do.
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What are the reasons for using Risk Management?

- ◆ Provides the format and analysis for an **apples-to-apples comparison** of environmental risks to other mission related risks.
 - ◆ Methods and formats for **communicating** risk is already established within NASA culture (e.g., ESMD, Shuttle, and ISS use risk). NASA senior leadership dashboard (ERASMUS) will have risk reporting.
 - ◆ **Sustainability has been hard to sell** at Headquarters. Mitigation strategies which reduce **risks to mission are much easier to communicate** and to acquire support from stakeholders. Risk mitigation strategies can become sustainability initiatives.
 - ◆ Risk can become a method to **inform the decisions** of people outside of environmental (e.g., potential liability assumed by future leadership).
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Example Risk Statement

- ◆ Given that (situation), there is a risk of (define potential risk). This poses a risk of (specify/quantify risk) to the (specific) mission. In order to eliminate/manage this risk, here are several options:
 - Define options and identify respective pros/cons, costs, & chances of success for each option
-



Example Risk Statement

◆ Example: Given that staff and funding resources are limited, there is a risk of significant regulatory noncompliance associated with new construction work for the Constellation Program. Regulatory enforcement actions could limit our flexibility in construction siting and work, and ultimately adversely impact cost and schedule of the Constellation program, and could delay demo and manned launches. Options to manage this risk could include:

- Develop short-term strategy to realign existing workforce
 - Seek relief from resource “caps”
 - Redirect existing workforce from lesser priority to higher priority environmental activities
 - Include regulatory fines in CofF cost estimates
-



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Purpose of NASA Environmental workshop?

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- ◆ **Identify and capture some of the issues and concerns** through 2010, and **identify possible threat scenarios** that may exist from 2010 through 2020 and beyond.
 - ◆ **Identify and analyze risks** for eight issues and **suggest actions** to address these risks.
 - ◆ **Identify and initiate next steps** for selected issues, scenarios, and risks.
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Risk Categories from 2005 NASA Environmental Workshop

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- ◆ Changing regulatory environment
 - ◆ Agency-wide historical/cultural resource policy/guidance
 - ◆ Energy
 - ◆ NASA leadership unfamiliar with environmental & cultural resources management responsibilities
 - ◆ Catastrophic release of hazardous material
 - ◆ Insufficient resources
 - ◆ Environmental & energy considerations not integrated with program/project lifecycle costing
 - ◆ Encroachment
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Current Status of Workshop Results

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- ◆ HQ EMD has been caught up in the same budget and program hot actions that we have and so have not finished reviewing the input from the Workshop. They have made it clear that they intend to use the input for future strategic decisions but have not yet identified the specific actions suggested at the Workshop for follow-up.
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Current Status of EFR

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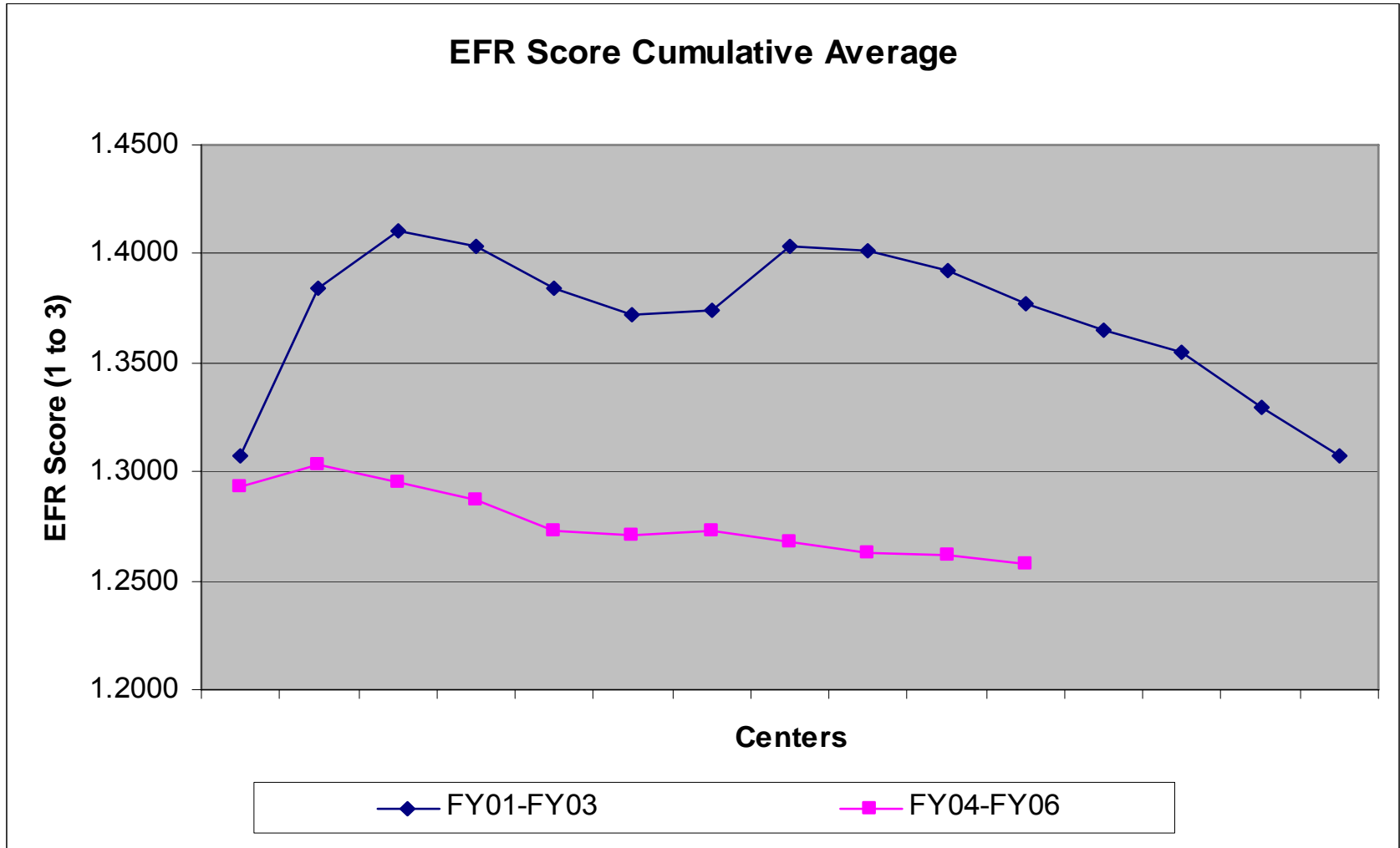
- ◆ Completed two full three-year cycles of all Centers and Component Facilities
 - ◆ Improving trend across the Agency in both EMS and compliance
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EFR Compliance Trend Data

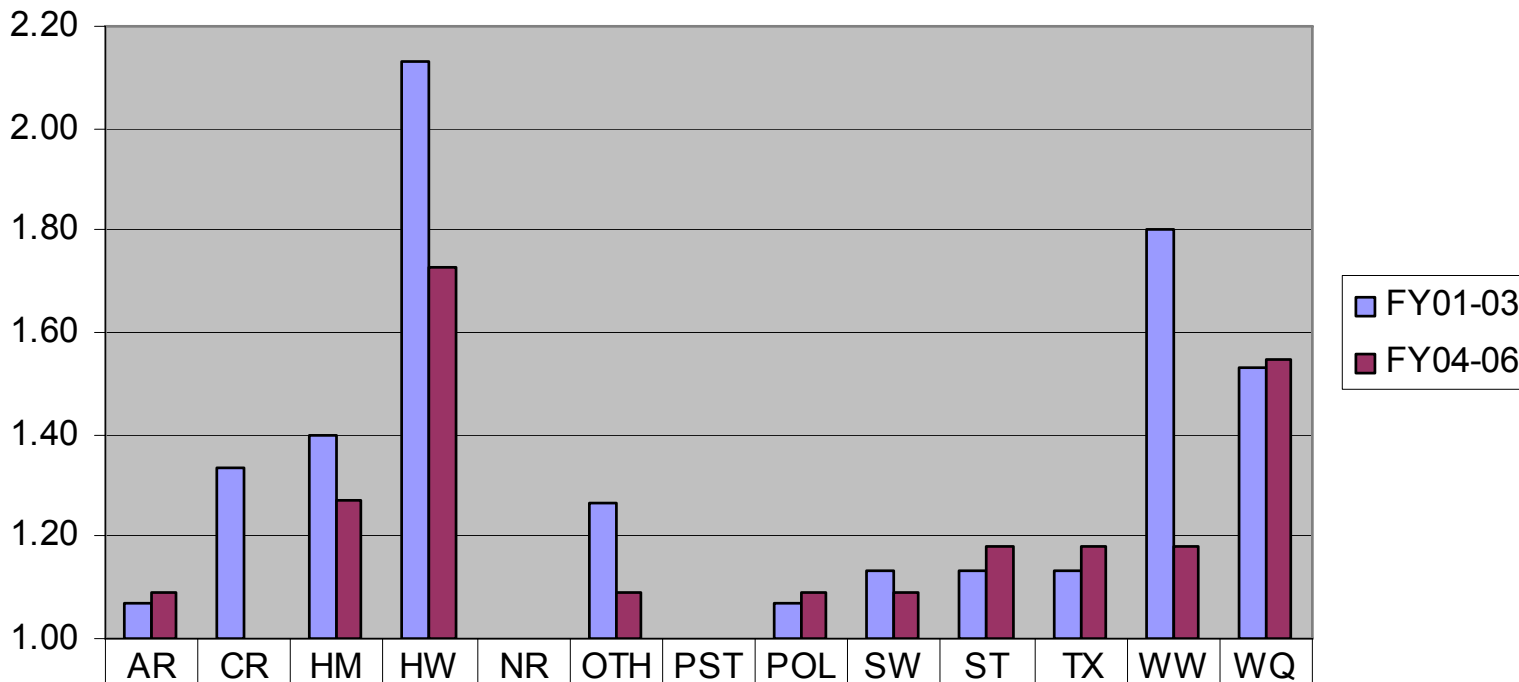
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EFR Compliance Trend Data

Protocol Score Changes



FY01-03	1.07	1.33	1.40	2.13	1.00	1.27	1.00	1.07	1.13	1.13	1.13	1.80	1.53
FY04-06	1.09	1.00	1.27	1.73	1.00	1.09	1.00	1.09	1.09	1.18	1.18	1.18	1.55



EFR FY07-FY09

◆ Adjusting team sizes

- Reduce auditor level by 50% for green technical programs
- Maintain current number of auditors for red or yellow technical programs, or any program at site Environmental Manager's request
- Maintain current number of auditors for EMS and Energy protocols

◆ Considering ASTM E2365 classification

- Prioritizes “real issues” versus “nits”
 - Provides validation of priorities
 - Supports health indicator ratings
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Recycling/Affirmative Procurement FY2006 Status

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- ◆ Significant improvements in AP efforts for high-dollar commodities
 - ▶ Paper products: 91% for \$1M+
 - ◆ Overall Agency waste diversion rate currently 76% (goal is 35%)
 - ◆ Affirmative Procurement EFR findings are less frequent and less critical
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Upcoming Challenges

◆ Biobased product procurement

- Process similar to CPG recycled content
- Will ramp up from 4 products (now) to 120 products within about 2 years

◆ Electronics Stewardship

- Although not yet “required”, is now on the PMA Scorecard
 - Will be required in FAR within next few months
 - Three major areas of interest
 - Procurement (EPEAT – IEEE 1680 compliant)
 - Operations (enable Energy Star; use of recycled products)
 - Disposal (no electronics to landfill)
-



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Energy Policy Act of 2005

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- ◆ Reduce buildings' energy intensity by 2% each year
 - Aggregate 20% reduction by FY2015 from FY2003

 - ◆ Electrical meters for all buildings by FY2012

 - ◆ Renewable portion of electricity consumption must be at least:
 - 3% in FY2007-2009
 - 5% in FY2010-2012
 - 7.5% in FY2013 and thereafter
 - Double credit for energy produced and used on-site
-



Emerging Contaminants

◆ Perchlorate

- HHS may be publishing data showing correlation between perchlorate in urine and decreased thyroid hormone levels
- EPA Guidance for perchlorate is 24.5 ppb, continued Congressional Pressure to establish an MCL
- No word on MCL in California

◆ TCE

- NAS report due next month will provide direction to EPA for further work on Risk Assessment

◆ Naphthalene

- Industry working on State of the Science Workshop and is looking to get Federal Government participation.

◆ NDMA

- California proposing Public Health Goal of 3 ppt.

◆ 1,4, Dioxane

- May be the next chemical of concern

◆ IRIS Reform

- Had been working with EPA and other Federal Agencies on a transparent and cooperative process. Higher level meeting needed
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What is Encroachment?

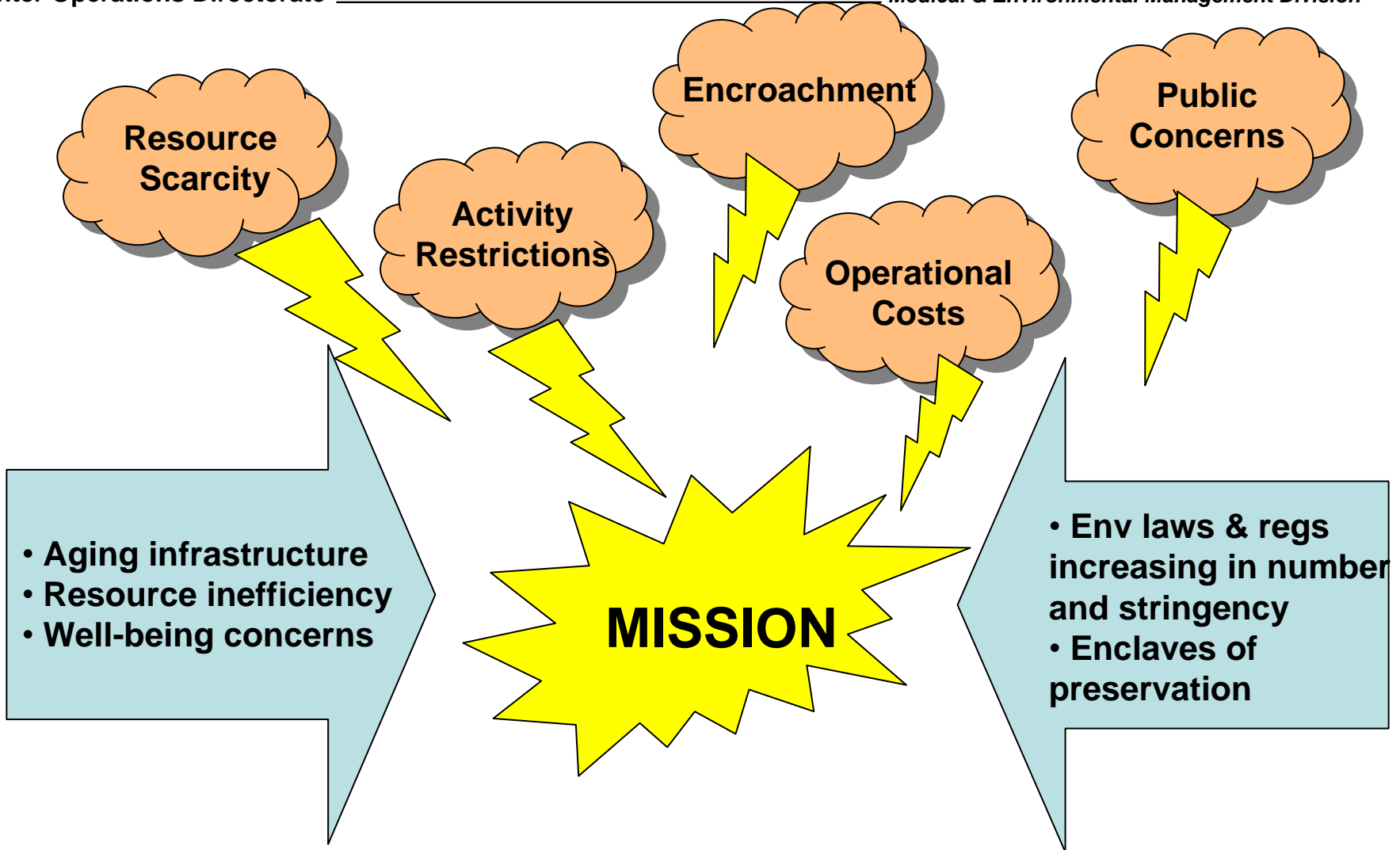
- ◆ Encroachment stems from the competition for scarce resources. It is the cumulative impact of pressures placed on NASA Centers & facilities and the surrounding communities and environmental controls resulting from:
 - ◆ Site specific growing development and urbanization;
 - ◆ Competition for air, land, water, energy, radio spectrum, and other resources;
 - ◆ Increasing regulatory burdens.
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Competition for Resources Impacts NASA's Mission

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Examples of Encroachment

SOME NASA ENCROACHMENT FACTORS:

◆ Competition for Airspace (including rocket launch airspace)	◆ Noise Pollution
◆ Range Safety Buffer Areas (land and sea)	◆ Air Quality
◆ Urban Artificial Light Pollution	◆ Endangered Species Habitat
◆ Shock Wave Buffer Areas	◆ Protection of Wetlands
◆ Security Buffer Areas	◆ Protected Marine Resources
◆ Protection of Critical Electromagnetic (Radio Frequency) Spectrum for Communications and Research	◆ Urban Growth Around NASA Centers and Facilities



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Center Encroachment Assessments

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Tentative Schedule

<u>LOCATION</u>	<u>"STARTING THE PROCESS"</u>
Marshall	July 2006
Site 2: (ARC)	August 2006
Site 3: (GRC)	September 2006
Site 4: (SSC)	December 2006
Site 5: (JSC)	January 2007
Site 6: (KSC)	February 2007
Site 7: (GSFC)	March 2007
Site 8: (LaRC)	April 2007
Site 9: (DFRC)	May 2007



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Recent Compliance Concerns

Denise DeLaPascua Thaller, NASA
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Compliance Inspections

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◆ Internal Inspections: January – June 2006

- Waste Management – 10
- SPCC – 3
- Solid Waste – 1
- Pesticides – 1
- Biomedical Waste – 2
- NPDES Stormwater Industrial – 1
- Registered Storage Tanks – 2
- NPDES Stormwater Construction – 1

◆ Regulatory Inspections: January – June 2006

- FDEP: Solid Waste – 2
 - FDEP: Industrial Wastewater – 1
 - BCNRMO: Registered Storage Tanks – 7
 - FDEP: Waste Management - 2
-



FDEP Waste Management Inspection

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- ◆ Inspection 7/5/06 and 7/21/06.
 - ◆ Focused on Treatment, Storage and Disposal Facility (TSDF), Construction Waste Management.
 - ◆ Inspected the TSDF, VAB High Bay Doors (East), Pad A Corrosion Control, VAB High Bay Doors (West), VAB Low Bay Roof, VAB High Bay Roof, LCC Roof.
 - ◆ Primary Issues:
 - Training, Job Descriptions, Accumulation Requirements (i.e. closed containers, labeling)
 - ◆ Corrective Actions:
 - Consistent policies across the Center to identify Construction Waste Management needs.
 - Add construction waste management sites to annual data call to all contractors.
 - Increase surveillance (by both contractor and NASA)
-



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Expansion of KSC Recycling Program

Alice Smith, NASA

TA-C3

KSC Recycling Coordinator

867-8454



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EXPANSION OF KSC RECYCLING PROGRAM

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- ◆ Current KSC Program recycles on average 363 tons of mixed paper, 16.5 tons of cardboard and 1,240 tons of metal annually
 - ◆ Expansion of program to include three common materials such as aluminum, glass and plastics.
 - ◆ Partner with Patrick AFB by utilizing their current contractor Association for Retarded Citizens (ARC) who can provide recycling support services to us at PAFBs' recycling facility.
 - ◆ Pilot program to run until April 2007, at which time a new consolidated contract to include mixed paper, aluminum, cardboard, glass and plastics will be established.
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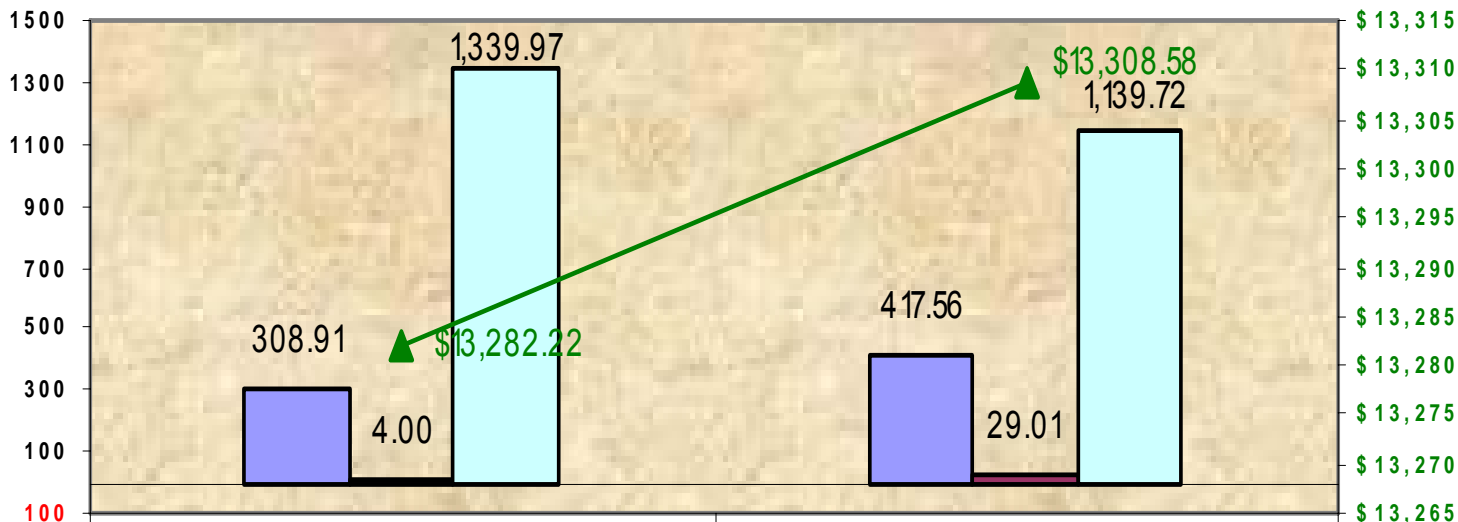
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EXPANSION OF KSC RECYCLING PROGRAM

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KSC Total Recycling

TONS



Paper (tons)	308.91	417.56
Cardboard (tons)	4.00	29.01
Metals (tons)	1,339.97	1,139.72
Proceeds	\$13,282.22	\$13,308.58



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Recycling Program Expansion

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- ◆ Based on PAFB data, we anticipate collecting annually about 7.31 tons AL, 8.7 tons plastic, and 13.34 tons glass
- ◆ Initial deployment to include 14 major facilities plus KARS #2, future expansion considered (O&C, HQs, CIF, SSPF, OSB1/2, LCC, PCC, ARF, USA LOG, OPF1/2/3)
- ◆ 220-225 containers deployed throughout the 14 facilities





Benefits

- ◆ Contributes to NASA goal to divert solid waste by 35%. KSC generates 45% of the NASA Agency solid waste
 - ◆ Will generate revenue which will only partially offset cost of PAFB support
 - ◆ Support employees desire for expansion of KSC's Recycling Program
 - ◆ Adds no burden to existing contractors or KSC staff
-



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Accountability

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- ◆ Employees should take all empty aluminum, plastics and glass containers and place them in the recycle containers
 - ◆ ARC will empty commodities from all containers once a week
 - ◆ KSC Recycling Coordinator will ensure sufficient containers are supplied to facilities for pilot program and resolve issues as needed
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KSC Avian Abatement Team

John Shaffer, NASA
TA-C3



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Avian Abatement Team

- ◆ Vulture struck ET on liftoff of STS-114
- ◆ An In-Flight Anomaly Review Board was established to address the potential safety risk to the Orbiter and crew.
- ◆ Avian Abatement Team established to investigate methods to deter vultures from around the Pads during launch





Avian Abatement Team

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- ◆ Goals of AAT:
 - ◆ Investigate methods to deter vultures from Launch Pads
 - ◆ Find Technology to monitor birds during launch.
 - ◆ Monitoring methodology (Dynamac) to validate effectiveness of deterrents
 - ◆ Strategy:
 - ◆ Road Kill Round Up (a.k.a. Posse)
 - ◆ The theory behind this was reducing the vultures food source would drive them away or at least reduce the number of vultures.
 - ◆ Daily bulletin notices and entrance marquee used to make employees aware of the problem with a number to call to report road kill.
-



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Avian Abatement Team

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SGS Roads and Grounds Crew
The “Posse”

Weekly totals by location, weight,
species (if identifiable)
~4000 lbs to date





Avian Abatement Team

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◆ Non-Lethal Deterrents

- Vultures are protected under the Migratory Bird Treaty Act
- Illegal to harass, or in any way harm vultures without a permit from the Fish and Wildlife Conservation Commission

◆ Failed attempts at deterring vultures:



Fogger using “Fog Force” Bird Deterrent



Speakers playing loud sounds ~80dB



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Avian Abatement Team

Successful Non-Lethal Deterrents

Hail Cannon- Pressure wave to ~25,000 ft

The "BIG GUNS"



Long Range Acoustical Device (LRAD)

~130 dB at 400 meters





Avian Abatement Team

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- ◆ Test Trapping to reduce the numbers of vultures that could potentially be flying around Pad during launch
- ◆ Depredation Permit issued to NASA from FWCC





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Avian Abatement Team

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- ◆ Radar used during STS-121 with support from JSC





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Avian Abatement Team

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- ◆ The Team feels that a Center wide program that includes awareness training, carrion removal, and sound deterrents will be effective.
 - ◆ Monitoring of bird activity at the Pads will be implemented to measure effectiveness of the program.
 - ◆ Cameras and Radar were successfully used for STS-121 and will be implemented for all future launches
 - ◆ LRAD to be mounted on RSS once approved by Shuttle Elements
 - ◆ Hail Cannon being tested
-



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Avian Abatement Team

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Shuttle Transition: Historic Preservation Survey

Mario Busacca, NASA
TA-C3



External Drivers and Risk

- ◆ National Historic Preservation Act (NHPA) requires all Federal agencies to locate and inventory historic properties for eligibility for inclusion on the National Register of Historic Places (NR)
 - ◆ This has not been done for NASA assets as related to the Space Shuttle Program
 - ◆ If Historic Property documentation is not prepared:
 - Space Shuttle Program (SSP) disposition of assets delayed
 - Citizen lawsuits could stop disposition of assets
 - Public perception and new NASA Programs could be affected
 - ◆ Result: Cost and schedule impacts to the Constellation Program, Shuttle Transition, and Institutional activities
-



KSC Response to Requirements

- ◆ Environmental Program Branch (EPB) requested funding to develop Review Criteria and conduct facility survey
 - Criteria act to limit the number of facilities listed
 - Funding provided by Master Planning in Spring 2005 (Thank you, Nancy Bray)
 - ◆ Informed NASA HQ of project – Summer 2005
 - ◆ HQ adopted approach for NASA-wide surveys
 - Established the Shuttle Transition Historic Property Working Group
 - Identified the need for \$535K to perform NASA-wide surveys
 - Originally to be requested from Shuttle transition, now to be funded by HQ ECR funds
 - KSC contractor will be performing the majority of the surveys
-



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Deliverables and Schedule

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- ◆ Center-wide SSP survey reports with eligibility findings
 - ◆ Agency-wide roll-up report (to be compiled by KSC) that will list all SSP assets surveyed based on 12 categories of property types and the eligibility findings
 - ◆ Contractor is able to start in August 2006
 - ◆ KSC Survey being conducted in July 2006
 - ◆ Survey work is expected to be completed in Spring 2007
-



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Shuttle Transition: Environmental Assessment

Mario Busacca, NASA
TA-C3



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External Drivers and Risk

- ◆ National Environmental Policy Act (NEPA) requires all Federal Agencies assess the impacts of their actions
 - ◆ This has not been done for the decision to terminate the Space Shuttle Program
 - Impacts of facility dispositions and related actions could have impacts on the environment
 - A major concern is impact to Historic Properties
 - ◆ Transfer, demolition or major modifications to Shuttle facilities cannot be done until this is completed
 - ◆ Result: Cost and schedule impacts to the Constellation Program, Shuttle Transition, and Institutional activities
-



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NASA Response to Requirements

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- ◆ Shuttle Environmental Support Team (EST) at MSFC requested funding to prepare an Environmental Assessment for the Shuttle Transition Program
 - ◆ EST currently conducting field visits to all major Centers affected by Shuttle transition to collect baseline data (KSC survey conducted two weeks ago)
 - ◆ EST targeting Spring 2007 for document completion
-



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Constellation Program: Environmental Support

Mario Busacca, NASA
TA-C3



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External Drivers and Risk

- ◆ Activities associated with Constellation are occurring across the Agency
 - ◆ Constellation Program Office at JSC has taken the responsibility to prepare a Programmatic Environmental Impact Statement (EIS) for the entire Program
 - Selected a Contractor
 - Currently responding to Data Call
 - Project start: June 2006; Project complete June 2008
 - Public Scoping Meetings targeted for Fall 2006
 - Cost: \$2.2M
 - ◆ Issue: Construction/Modifications of facilities cannot begin until the EIS is completed
-



KSC Response to Short Term Needs

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- ◆ KSC will perform an Environmental Assessment (EA) for those projects that need to begin prior to June 2008

	FY06	EA FY07	EIS Complete FY08	EIS FY09-10
•GOX Arm		◆		
•Lightning Mods		◆		
•New Swing Arm		◆		
•VAB Platforms		◆		
•Ops Flights				◆
•CaLV Mods				◆



NEPA and Other Requirements for Constellation Program

- ◆ Received funding for EA (\$75K) for FY06
 - August 2006 start
 - Targeting December 2006 for complete (latest March 2007)
 - ◆ Historic Preservation requirements are likely to be the major issue for mods to existing facilities (LC-39B, VAB, LCC)
 - Requires coordination with the State Historic Preservation Office (SHPO)
 - May require mitigation
 - Requested \$100K for mitigation for FY07
 - ◆ Do not anticipate any show-stoppers to beginning work to support Constellation in a timely manner
-



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FY2007 Environmental & Energy Project Proposals Solicitation

Diane Callier, NASA
TA-C3



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FY2007 Environmental & Energy Project Proposals

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- ◆ KSC Environmental Program Branch (EPB) will review and evaluate project proposals for limited available funding
 - ECR
 - TA discretionary
 - Recycling
 - ◆ The EPB will rank project proposals in priority order and match proposals with the best funding source
 - ◆ The EPB will maintain the list for additional project funding purposes should circumstances change and previously selected projects be delayed, additional funding become available, project costs turn out to be lower than anticipated (yeah, that'll happen), etc.
-



FY2007 Project Proposals

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- ◆ Project proposals should use format provided in e-mail
- ◆ All project proposals due to TA-C3 by August 18
- ◆ Proposals should include ALL associated costs (e.g. installation, implementation, etc.)
- ◆ Eligible projects should cost between \$2.5K – 250K
- ◆ Projects will be evaluated, ranked and selected within TAC
- ◆ The better the environmental benefits are characterized and quantified, the better chance for funding
- ◆ Projects funded in 2007 will require post-project close-out reports



FY2007 Project Proposal Format

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FY07 KSC Environmental/Energy Project Proposal

◆ Environmental Program Area: Check all which apply

◆ Recycling

◆ Pollution Prevention

◆ Compliance

◆ Permitting

◆ Natural Resources

◆ Environmental Management System

◆ Affirmative Procurement

◆ Cultural/Historic Resources

◆ Other – specify _____

◆ Project Description:

➤ Schedule for Funding & Project Completion

➤ Estimated Comprehensive ROM Cost

➤ Expected Environmental/Cost Benefits

➤ Metrics to Measure Success

➤ Proposed Contract Vehicle

➤ Project Manager



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FY2007 Project Proposals

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- ◆ Project proposal solicitation and format were e-mailed to the Environmental Working Group

 - ◆ Proposals should be submitted through the identified EPB Contacts:
 - Denise DeLaPascua-Thaller – Permitting & Compliance
 - Mario Busacca – Natural/Cultural/Historical Resources
 - Harry Plaza – Energy
 - Alice Smith – Recycling, Aff Procurement, P2, EMS

 - ◆ For additional copies of solicitation and format, contact diane.k.callier@nasa.gov
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DYCOH

Drop Your Chemicals
Off Here
Program

Barry Hamilton, CHS



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DYCOH Overview

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- ◆ The DYCOH program has been developed to give KSC tenant organizations another option to dispose of small quantity products and universal wastes.
 - ◆ This service is meant for small quantity, non routine wastes, **not for process wastes or repetitive product wastes.**
-



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DYCOH Overview

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- ◆ This service may ease regulatory compliance issues associated with on site management of these materials such as
 - ◆ Waste Storage
 - ◆ Containerization
 - ◆ Waste Management Paperwork (PWQTRP is not necessary)
-



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LOCATION AND TIMES

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- ◆ TR1-0622, Tuesday and Thursday 1300-1400
 - ◆ TR1-0622 is located just West of facility K7-416B in the Propellants North Area.
 - ◆ Upon arrival customers will be asked to complete a DYCOH log sheet prior to being escorted to K7-115, which is a secure facility used for waste storage.
-



Materials Accepted

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- ◆ **Small quantity items** – Includes all unused or expired laboratory chemicals, paints, adhesives, coatings, corrosive, toxic or flammable liquids, etc... that are not process wastes and are in containers equal to or less than 5 gallons in size (See Quantity Guidelines and Safety Precautions). **These materials will only be accepted with appropriate MSDS presented with items.**

- ◆ **Does not include explosive, radiological, PCB or infectious Materials.**

- ◆ **Aerosol cans** - Empty, full, partially full and defective aerosol cans. (This does not include cylinders of any type-including propane)

- ◆ **Mercury containing fluorescent lamps** - Including straight, U-tube, and HID lamps. Lamps should be delivered in the original or similar packaging. Broken lamps will be accepted but must be placed in tightly closed/sealed containers (such as tear-resistant bags) prior to delivery to the collection facility. Box-load quantities of lamps from routine sources should be packaged in accordance with PWQ/TRP instructions and requested for pick-up via ~~Waste Support Requests.~~



Materials Accepted – cont'd

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- ◆ Mercury batteries
 - ◆ Nickel cadmium (Ni-Cad) batteries - Wet and dry cell batteries.
 - ◆ Lithium batteries.

 - ◆ Mercury containing articles – Including thermometers, thermostats, and switches. Broken articles and the free flowing mercury will be accepted but must be placed in a tightly closed/sealed container to prevent the release of mercury to the environment. Only minimal amounts of contaminated media/debris may be placed into the container. In the event of a cleanup involving a broken article and large volumes of contaminated media and/or debris the waste generator must manage the waste through the Process Waste Questionnaire (PWQ) system (reference EVP-I-0001, “JBOSC Waste Generator Handbook”). Contact JBOSC Waste Management at 867-8642 for assistance.
-



Quantity Guidelines and Safety Precautions

- ◆ KSC organizations utilizing the K7-115 drop-off location are not required to obtain prior approval before safely delivering acceptable materials of less than 10 gallons. If there is concern over safety, or for quantities greater than or equal to 10 gallons, contact Joe Delrose at 861-1331. Greater than 10 gallon volumes will be handled on a case-by-case basis.
 - ◆ KSC organizations must exercise caution when transporting waste materials. Waste containers should be in good condition, segregated by hazard, and secured for transportation (such as in boxes or tote trays) to contain possible spills, avoid injury, and prevent releases to the environment.
 - ◆ **JBOSC Waste Management reserves the right to refuse wastes that do not adhere to these guidelines.**
-



Storage Prior to Drop Off

- ◆ Prior to delivery to the collection facility, waste materials should be managed in compliance with all safety and fire protection standards. Waste materials must be transported to the DYCOH collection facility on the next available date, unless they are being accumulated at approved storage areas.
 - ◆ For additional information please contact Joe Delrose, JBOSC Waste Management, at 861-1331
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Reference

- ◆ Space Waste Services Guidance Manual
EVM-I-0446-16