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U.S. Army Research, Development and
Engineering Command



TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

**Zero Footprint Camp:
Waste Is a Resource**

**2009 Environment, Energy & Sustainability
Symposium & Exhibition
Colorado Convention Center
4-7 May 2009**

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**MOBILE WASTE TO
ENERGY CONVERSION**



**WASTE WATER PROCESSING
& REUTILIZATION**

"DESIGNER TRASH"



ZFC



KITCHEN SANITATION SYSTEM

COMPOSTING



Current Approach



Supplies (Logistics)

Food
Water
Fuel
Personal Items

Waste

Dirty Used Water
Sewage
Food Garbage
Trash
Exhaust

Managing the Waste



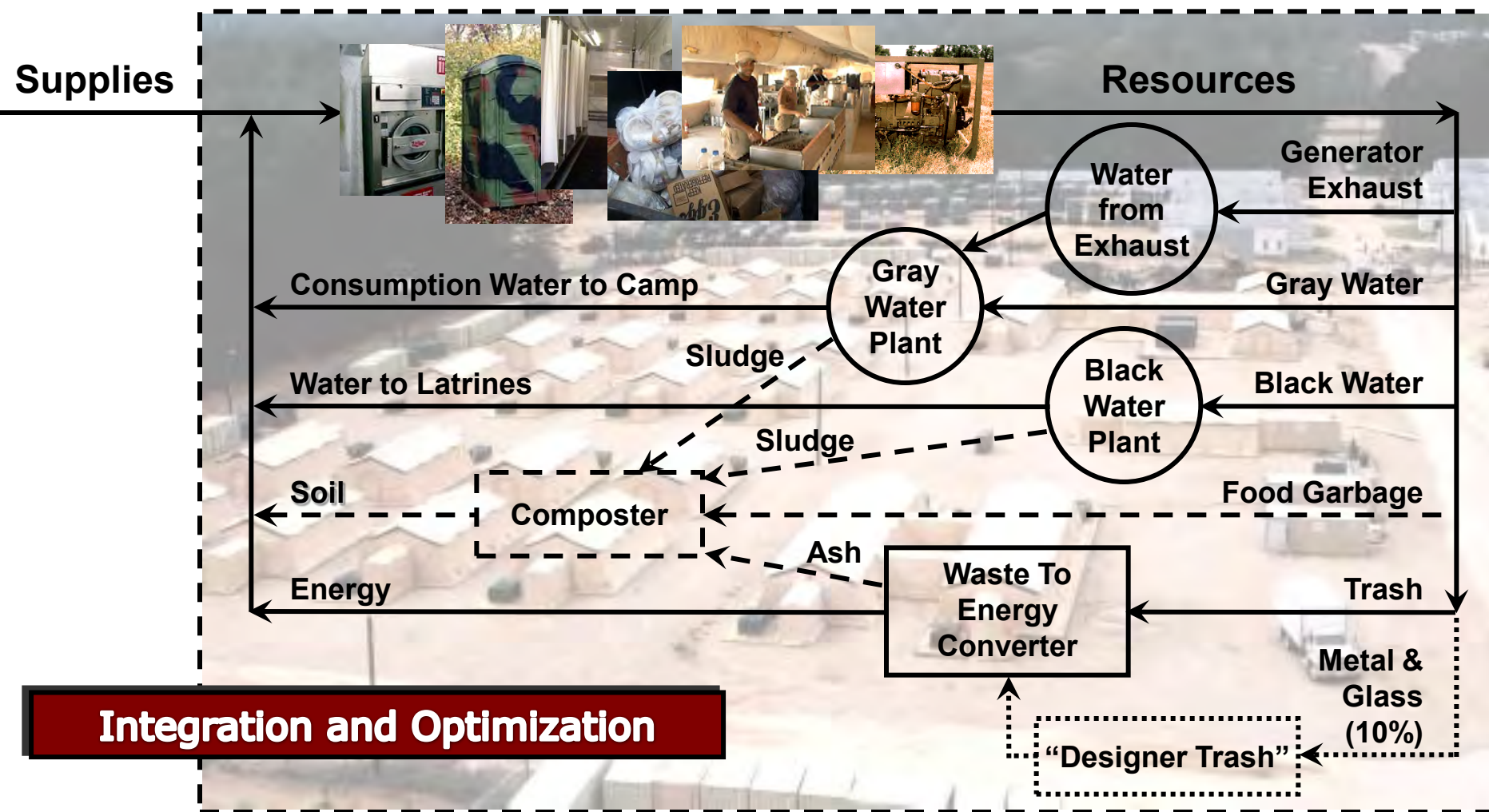
TzC Approach



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ZFC Integration: "Thinking Back Inside the Box"





- Relatively short window of opportunity
 - Length of current operations
 - Limited life span of lessons learned
- Demonstrate benefits to warfighters ASAP
 - Increased force protection
 - Decreased logistics footprint
- Implement spiraling acquisition concept
 - Field what's available now
 - Incorporate advancements when available



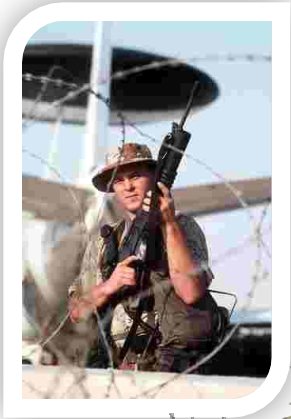
Potential Technologies or Systems



- Waste to Energy Conversion
- Gray & Black Water Processing
 - Integrated Battlefield Support System (IBSS) Membrane Bioreactor
- Gray Water Processing
 - Force Provider Shower Water Reuse System (SWRS)
- Black Water Processing
 - Spiral CAT
- Water from Exhaust
 - IBSS
- Designer Trash
 - Several Natick Soldier Center efforts underway
 - Army Environmental Quality Technology Program (EQT)
 - Strategic Environmental Research & Development Program (SERDP)
 - Environmental Security Technology Certification program (ESTCP)
 - DoD Combat Feeding Program

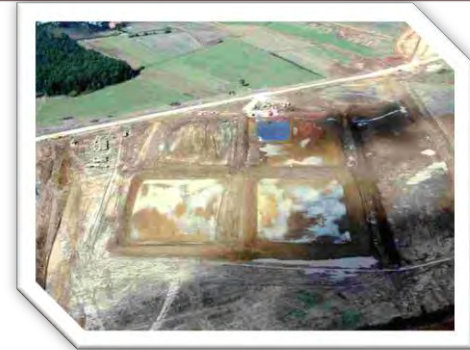


The ZFC Impact



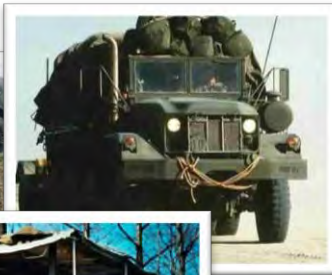
Force Protection

Intelligence: Eliminates Enemy
Intelligence Source
Physical Security: Eliminates
need for Civilian Access
Health: Reduced DNBI
Rates



Environment

Eliminates Compliance & Clean-Up
Provides Enriched Soil for Soldier
or Host Nation Use
Reduces Greenhouse Gas Emissions
Zero Footprint



Logistics & Sustainment

Reallocation of Engineer Assets
Water Requirements Reduced by up to 80%
Power Generation Augmented by 30%
Diesel Fuel Requirements Reduced by 30%
Transportation:
Supply Convoys Reduced
Waste Convoys Eliminated

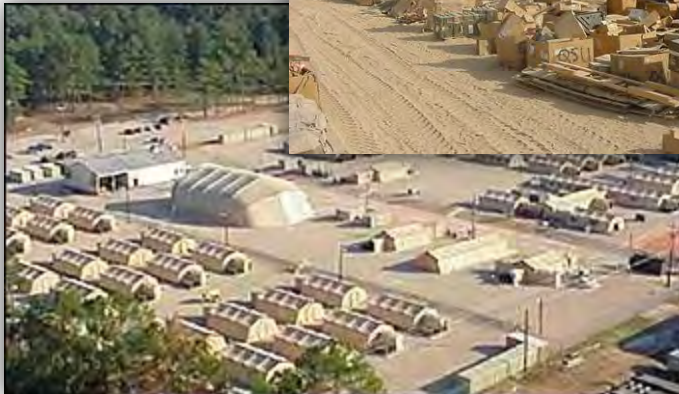


Potential Applications



Military

Operation Iraqi Freedom
Operation Enduring Freedom
Balkans Area of Operations
Force Provider Modules
Division Support Areas
Temporary Ports



Civilian

Humanitarian Relief
Disaster Aid



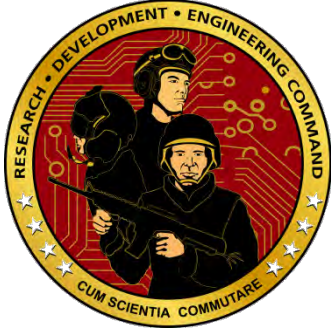
Recent Developments



- Validated AERTA Requirement → High Priority P2
- PM-FSS Endorsement → Coordinating & Chairing an Environmental Technology Working Group
- NATO/SPSC Workshop → ZFC Concepts Integral to "Best Practices" Guide
- Engineer School → Chairing a Base Camp ICDT
- DASA (ESOH) → "Tell me how I can help"



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