Sustainability Logistics-Basing, Science and Technology Objective – Demonstrations (SLB-STOD)

Team Leader SLB-STOD

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Joint Committee on Tactical Shelters- Update
18 November 2014

RDNS-SEE

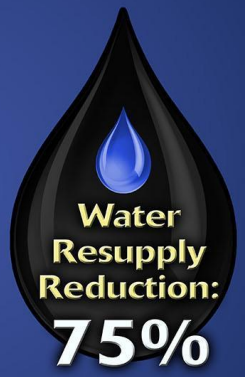
Sustainability / Logistics-Basing

Technology Enabled Capability Demonstration (TECD) 4a

STO D

RDECOM AMSAA CERDEC TARDEC ARL IMCOM

Objectives:



Integrated Model Based Systems Engineering Approach to Demonstrate a Significant Reduction in Sustainment Resupply…

…While Maintaining Quality of Life and Increasing Self Sufficiency at Extra-Small/Small Base Camps.

Sustainability & Logistics-Basing 4a Concept – 0V1

Integrated, Waste, Water and Fuel Management Solutions for Initial and Temporary Base Camps

Extra Small (50 – 299 PAX)

Small (300 – 1999 PAX)

50-149 Pax

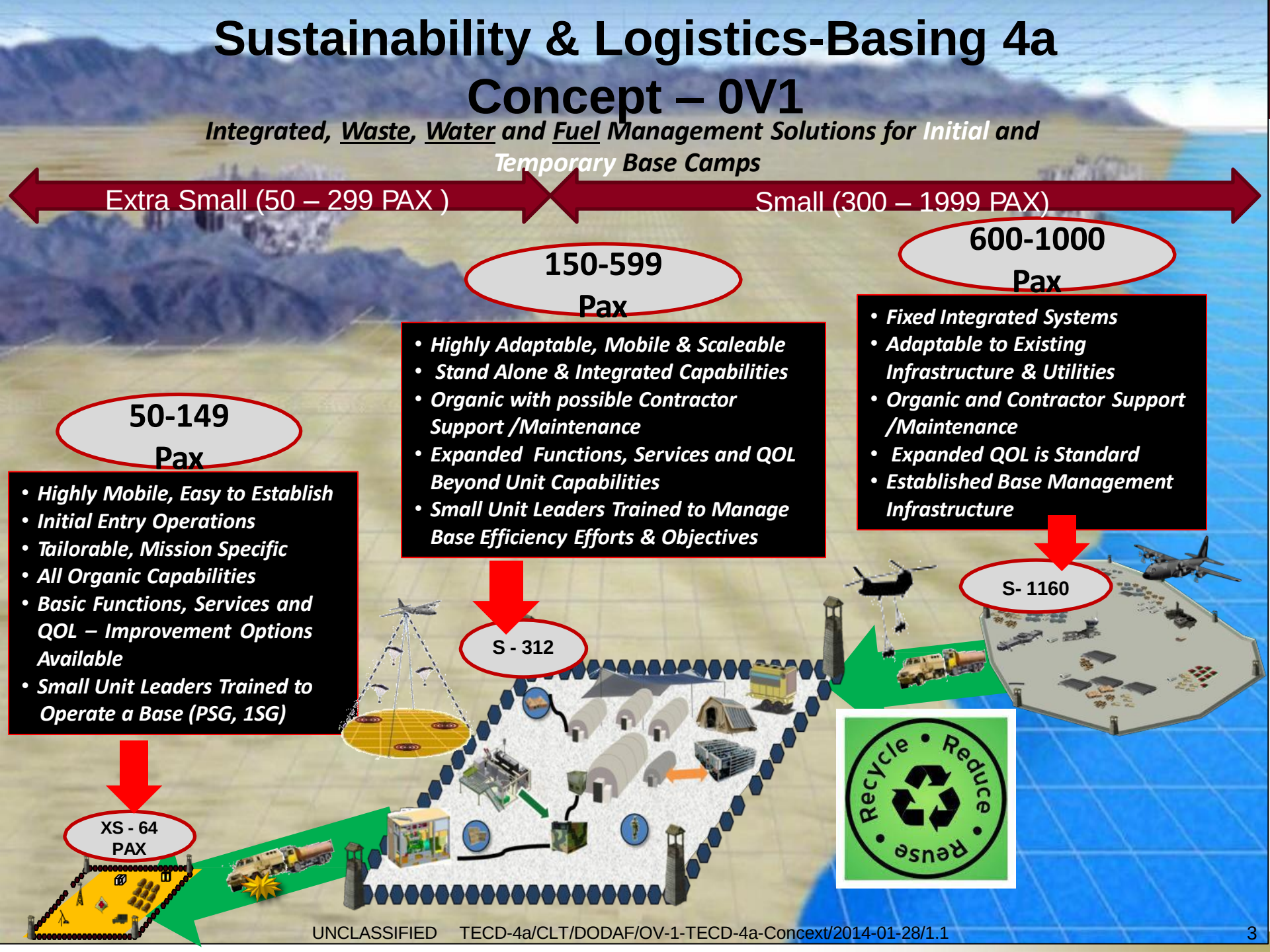
- *Highly Mobile, Easy to Establish*
- *Initial Entry Operations*
- *Tailorable, Mission Specific*
- *All Organic Capabilities*
- *Basic Functions, Services and QOL – Improvement Options Available*
- *Small Unit Leaders Trained to Operate a Base (PSG, 1SG)*

150-599 Pax

- *Highly Adaptable, Mobile & Scaleable*
- *Stand Alone & Integrated Capabilities*
- *Organic with possible Contractor Support /Maintenance*
- *Expanded Functions, Services and QOL Beyond Unit Capabilities*
- *Small Unit Leaders Trained to Manage Base Efficiency Efforts & Objectives*

600-1000 Pax

- *Fixed Integrated Systems*
- *Adaptable to Existing Infrastructure & Utilities*
- *Organic and Contractor Support /Maintenance*
- *Expanded QOL is Standard*
- *Established Base Management Infrastructure*



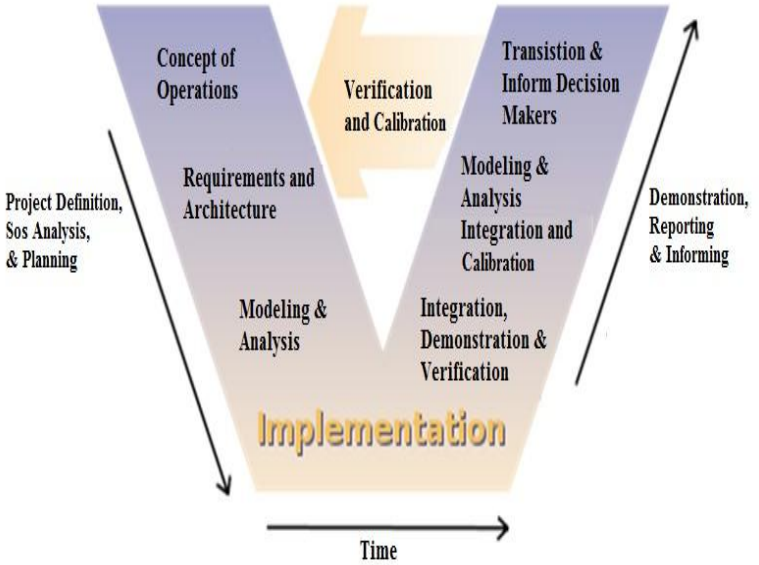
Vision For Success: Sustainability/Logistics-Basing

Model Based ***Systems Engineering*** (MBSE) Approach

- Analysis will show how we will meet our objectives

Operationally Relevant ***Demonstrations***

- Both systems and components
- Materiel and non-materiel solutions

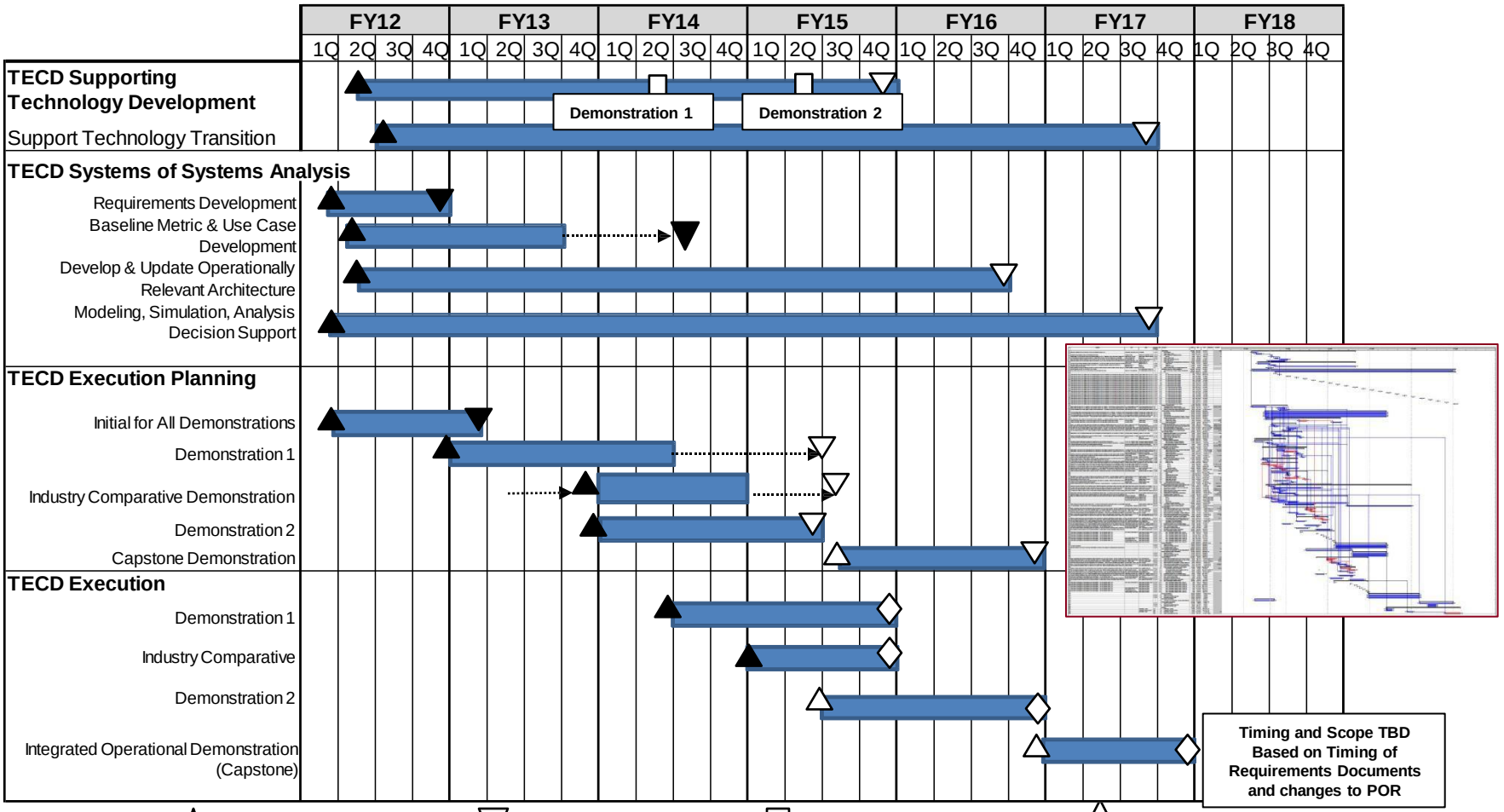


Integrated Solution ***Architectures*** that address ICD Capability Gaps

Modeling and Simulation Capabilities and Analytical Results will be critical components of our Demonstrations

Knowledge and Technology Transition, a key measure of success

Critical Path: Overall Milestone Schedule



Legend:

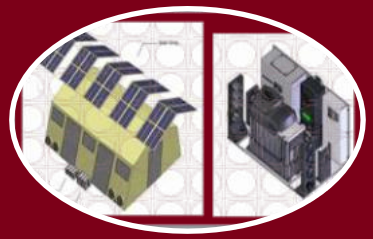
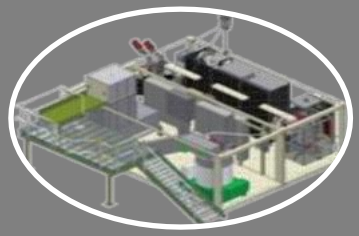
Planned Start | Planned End | Planned Milestone | Planned Significant Milestone

Schedule Slip | Actual Start | Actual End | Actual Milestone | Actual Significant Milestone

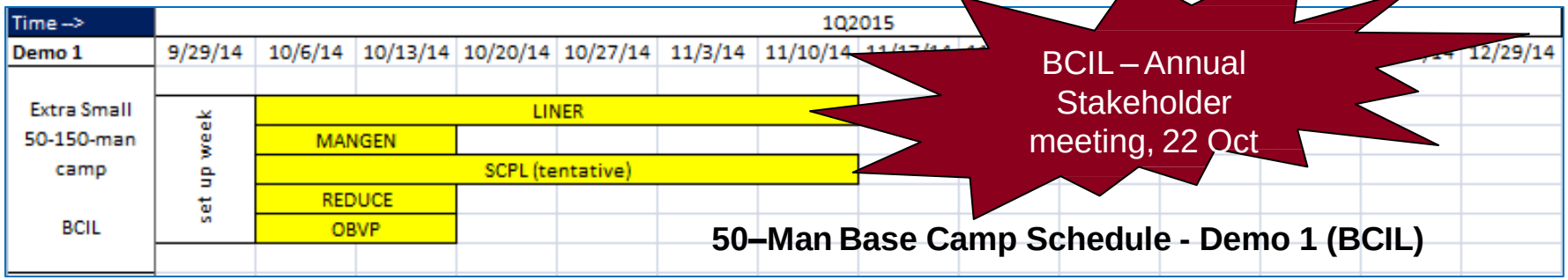
TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Sustainability Logistics Basing STO-D
Focus Areas and Enabling Technologies

STO-D Focus Areas

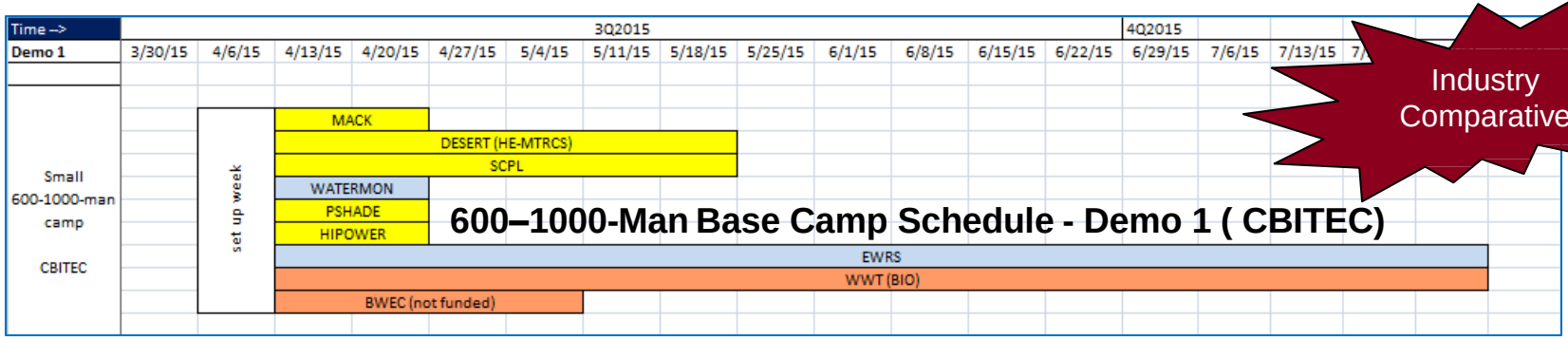
	Fuel Demand Reduction 25%	Water Demand Reduction 75%	Waste Reduction 50%
			
TECD Technology Thrust Areas	• Supply Side-Power Generation • Supply Side-Alternative Thermal / Electric Energy • Supply Side Power Control, Distribution, Storage • Demand Side-HVAC • Demand Side-Habitation Systems • Demand Side-Organizational Systems	• Supply Side-Water Purification • Supply Side-Water Generation • Supply Side-Water Recycling & Repurposing • Demand Side-Organizational Systems	• Source Reduction • Waste Reduction and stabilization • Waste to Energy • Waste Re-purposing • Water Based Liquid Waste Management • Waste Management Analysis • Planning and Management Tools
Enabling Technologies (Examples)	• Microgrids • Integrated Energy Efficient Shelters (Liners, HVAC, Lighting) • Fixed and Flexible Photovoltaics • Energy Efficient Organizational Systems (Kitchen, Laundry, etc)	• Water Recycling & Reuse • Water Quality Monitoring • Water Efficient Organizational Systems (Kitchen, Laundry, Hygiene) • Water Generation (Air, etc)	• Waste Source Reduction • Waste to Energy Conversion • Blackwater Dewatering

Demo 1 Schedule and Venue



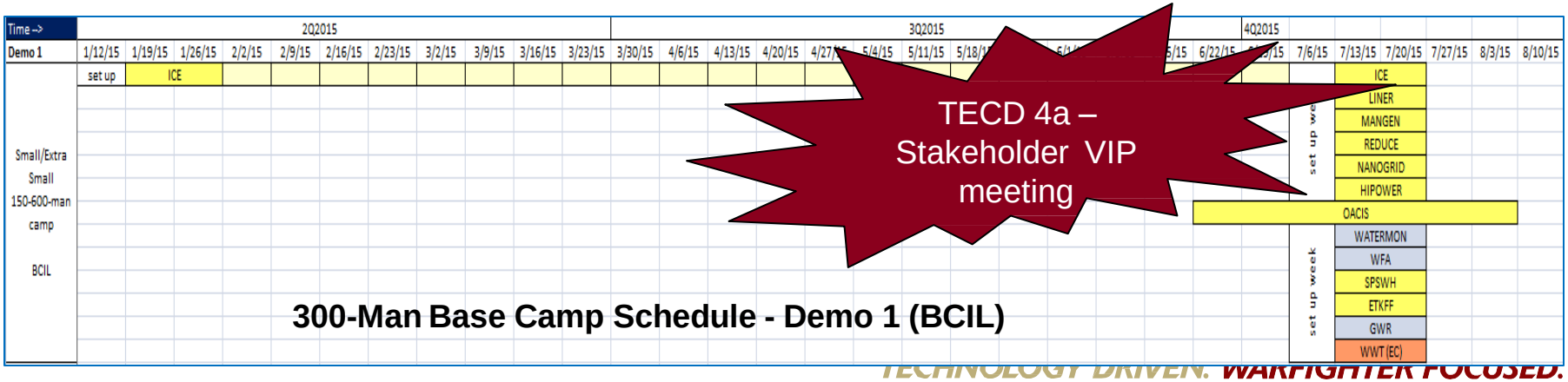
BCIL – Annual Stakeholder meeting, 22 Oct

50–Man Base Camp Schedule - Demo 1 (BCIL)



Industry Comparative

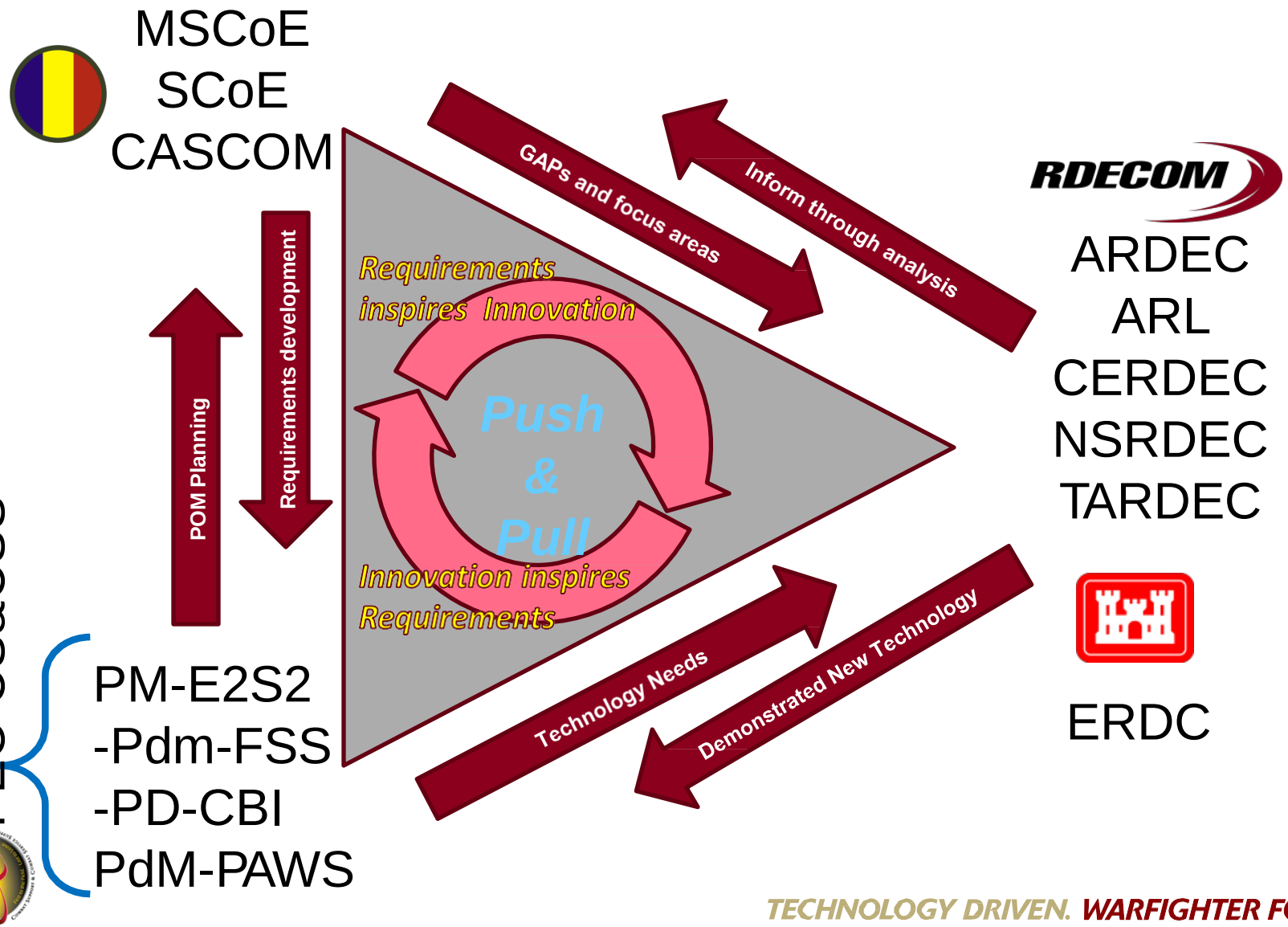
600–1000-Man Base Camp Schedule - Demo 1 (CBITEC)



TECD 4a – Stakeholder VIP meeting

300-Man Base Camp Schedule - Demo 1 (BCIL)

TECD 4a Transition Lifecycle Partnership



Self-Sufficient Capabilities for Expeditionary Basing Operations (SSCEBO), COP

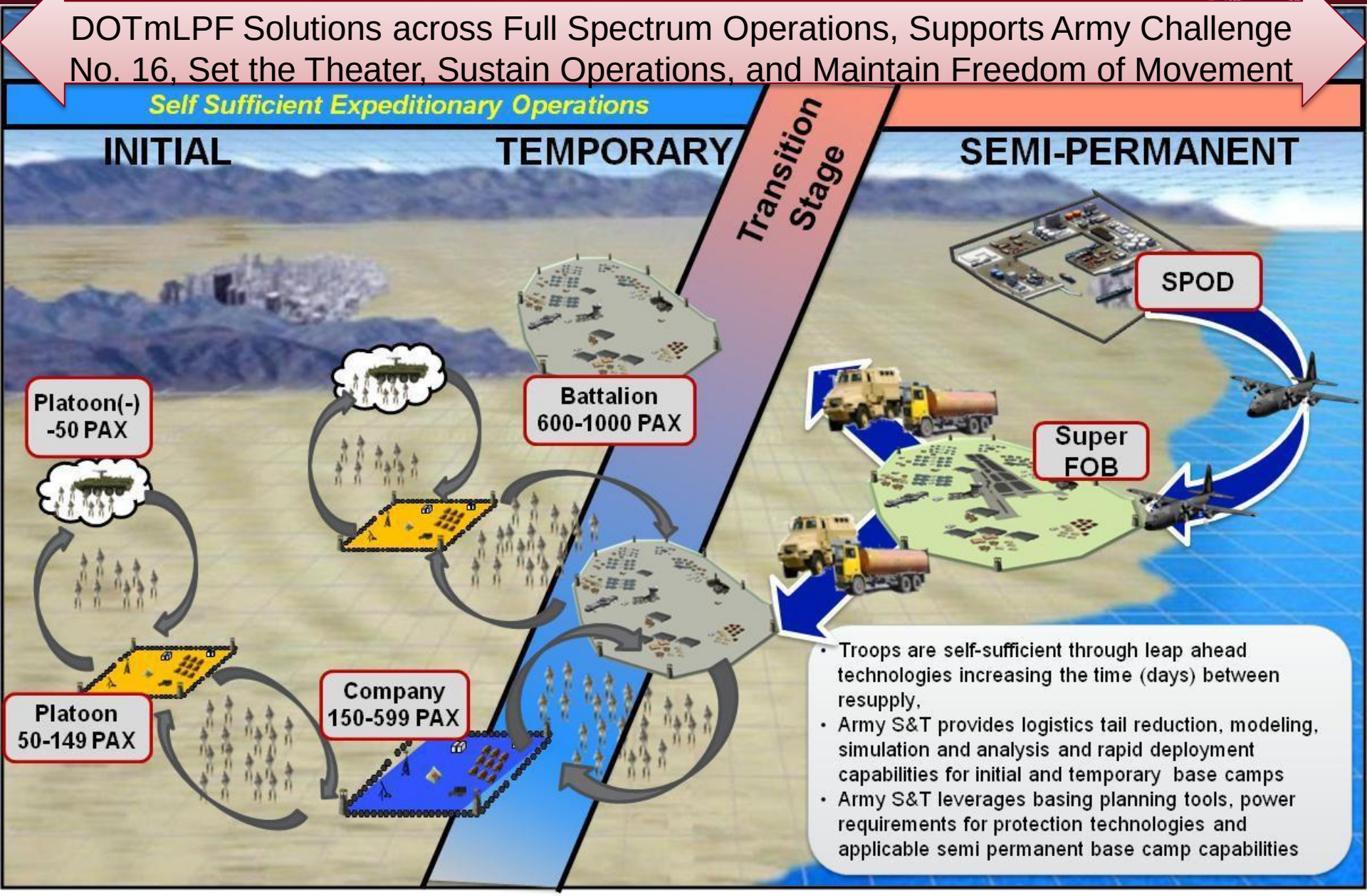
NSRDEC
Deputy Lead

SSCEBO BLUF – Mr. Kidd (DASA-Energy and Sustainability), 21 Oct

- Science and Technology supporting the New Army Operating Concept
- Focused on base camp sized from 50 – 1999 PAX
- Understands relationship between base camp efficiency and Soldier Quality of Life for optimal Soldier Readiness
- Leverages existing, highly collaborative foundation:
  - TRADOC,
  - Program and Product Mangers,
  - Multiple RDECOM organizations
  - Army Corp of Engineers

Operational Concept (draft)

DOTmLPF Solutions across Full Spectrum Operations, Supports Army Challenge No. 16, Set the Theater, Sustain Operations, and Maintain Freedom of Movement



SSCEBO Technology Focus

Camp Size
★ Extra Small
★ Small
Medium
Large

Construction Standards
★ Initial
★ Temporary
Semi permanent

Base Camp Capabilities
★ Basic
★ Expanded
Enhanced

Quality of Life
★ Basic
★ Expanded
Enhanced

Source:
ATP 3-37.10

★ = Technology Focus

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

S&T Vision from COP

	Current State	Evolving Army Challenges	S&T FY17& Beyond
Operational	•Base Camp set up degrades mission •Increased vulnerability	•Multiple AORs •Growing Power Demand •Base Camp self-sufficiency with reduced logistical tail •Retained overmatch with smaller Army •Soldier Quality of Life essential for ability to stay "Ready to Fight"	•Regional specific analysis for days of self-sufficiency, logistics reduction and quality of life •Revolutionary technologies tailored to multiple AORs: •Robust Quality of Life modeling informs Leadership on essential services for Soldier Readiness
S&T	•Focused on single AOR •Incremental, near term development ➢Fuel resupply reduction 25% ➢Water resupply reduction 75% ➢ Waste back haul reduction 50% •Baseline Quality of Life modeling		

Collaborative Effort

"We have to be a globally responsive Army… leaner, smaller, tailorable, scalable.. We have to be expeditionary… We have to get there with the least amount of support possible."

-- ***Army Chief of Staff GEN Raymond T. Odierno, speaking to the AUSA – Institute of Land Warfare Breakfast, 23 January 2014***

Self Sufficient Basing Efforts

- RDECOM Policy # 55, Enterprise Collaboration, 16 Jan 2014
  - Kickoff meeting with Mr. Ormond on 15 April with all COP leads
  - Charter development underway – No decision Making Authority
  - At this time, no funding for integrated demonstrations
  - SSCEBO may influence potential STOs for technology areas under the community of practice
  - Plan to submit community overarching STO for FY 16 cycle
- Integrated POM 17 – 21 planning meeting 25 – 26 June at BCIL, Devens MA
  - RDECOM POM FY 17 – 21 Planning Guidance memorandum, 15 Apr 14
  - Soldier/Squad Portfolio: SSFOB (NSRDEC)
- MSCoE – S&T workshop/process for program endorsement 20 – 22 May
  - Signed Endorsement memorandum from MSCoE received on 5 Sept

Takeaway: SSCEBO COP (RDECOM), Integrated POM build (S4EO) and any follow on community STO, individual STO(s) are all related but *separate efforts*

Questions

Backups

TECD 4a Demo 1 Technologies (1/2)

#	Technology	Lab/ RDEC	Ready
01	Modular Appliances for Configurable Kitchens (MACK)	NSRDEC	2Q14
02a	Desert Environment Sustainable Efficient Refrigeration Technology (DESERT)	NSRDEC	4Q13
02b	Onsite Automatic Chiller for Individual Sustainment (OACIS)	NSRDEC	4Q13
03	Energy Efficient Expedient Shelters with Non-woven Composite Insulation Liners	NSRDEC	1Q13
04	Innovative Cooling Equipment (ICE)	CERDEC	3Q14
~~05~~	~~Alternative Fuels Qualification~~	~~TARDEC~~	~~4Q14~~
06	Self-powered Solar Water Heater	NSRDEC	3Q14
07	1kWe JP-8 Fueled, Man-Portable GenSet	CERDEC	2Q14
08	Single Common Powertrain Lubrication (SCPL)	TARDEC	4Q13
09	Renewable Energy for Distributed Under-supplied Command Environments (REDUCE)	CERDEC	2Q13
10	Real Time Inline Diagnostic Technology for Water Monitoring	TARDEC	4Q13
~~11~~	~~Water Recycling for Mobile Kitchens and Sanitation Centers~~	~~NSRDEC~~	~~4Q14~~
12	Gray Water Reuse	TARDEC	4Q14
13	Modular Force Water Generation Storage & Analysis (Water From Air)	TARDEC	2Q14

TECD 4a Demo 1 Technologies (2/2)

#	Technology	Lab/ RDEC	Ready
14	Wastewater Treatment	TARDEC	4Q14
15	Waste to Energy Converter	NSRDEC	2Q14
16	Combat Support Hospital – Shelter Radiant Heating System (SRHS)	NSRDEC	~~3Q13~~
17	Power Management and Control Technology (Nanogrid)	NSRDEC	1Q13
18	Bi Directional Onboard Vehicle Power (OBVP)	TARDEC	1Q13
19	Expeditionary TRICON Kitchen System Appliance Integration	NSRDEC	2Q14
20	PowerShade Cost Reduction	NSRDEC	3Q14
21	Expeditionary Wastewater Recycling System (EWRS)	REF	~~3Q14~~
22	Energy Informed Operations (EIO)	CERDEC	1Q13
23	Coagulation/Flocculation for Shower Water Reuse System (SWRS)	TARDEC	
24	Energy Efficiency (E2) Optimization of COP/PB Shelters	NSRDEC	
25	Deployable Metering and Monitoring System (DMMS)	ERDC	
26	Hybrid Power Trailer (HPT)	ERDC	
27	Structural Insulated Panel Hut (SIP-HUT)	ERDC	

TECD 4a Demo 2 Technologies (1/2)

#	Technology	Lab/RDEC
01	Wind Energy Systems for Base Camp Applications	NSRDEC
02	Superconducting Magnetic Energy Storage (SMES) for Microgrids	ARL
03	Expeditionary Mobile Base Camp Demo (S2)	NSRDEC
04	Advanced, Energy Efficient Shelters	NSRDEC
05	Energy Efficient Shelter Systems	ERDC
06	Advanced Thermoelectric Generators	NSRDEC
07	Containerized Ice Making Technologies (CIMT)	NSRDEC
08	Joint Inter-Service Field Feeding Burner (JIFF)	NSRDEC
09	Material Development for Water Purification (AARID)	ARDEC
10	Scalable technology for military and humanitarian water purification applications	CERDEC
11	Water Recycling for Mobile Kitchens and Sanitation Centers	NSRDEC
12	Coagulation/Flocculation for Shower Water Reuse System (SWRS)	TARDEC
13	Solid Waste Remediation System for Small Contingency Base Camps	NSRDEC
14	Energy Efficiency (E2) Optimization of COP/PB Shelters	NSRDEC

TECD 4a Demo 2 Technologies (2/2)

#	Technology	Lab/RDEC
~~15~~	~~Adaptation of Oil Field MVR Water Purification Technology to Mobile Infantry Needs~~	~~TARDEC~~
16	Quiet, Multi-Fuel MCC Engine & Generator	CERDEC
17	Efficient Water Reuse Technologies for COBs	ERDC
18	Sustainable Technologies for Ration Packaging Systems	NSRDEC
19	Ration Packaging Reconfiguration	NSRDEC
20	Exploration of Water Demand Reduction Technologies for FOB Organizational Equipment	NSRDEC
21a	Self-Sustaining Living Module (SLIM) - Leidos	NSRDEC
21b	Self-Sustaining Living Module (SLIM) - TPI	NSRDEC
22	Nanoparticle-polymer composite for Soldier power and energy	NSRDEC
~~23~~	~~Rapidly Deployable Lightweight Shelters for Austere Environments~~	~~NSRDEC~~
24	Gray Water Reuse [demo 2]	TARDEC
~~25~~	~~Hybrid Energy Storage Module~~	~~CERDEC~~
26	Bi Directional Onboard Vehicle Power (OBVP) [demo 2]	TARDEC
27	Self-Powered Water Treatment for Forward Operating Bases (Cambrian Innovation)	TARDEC
28	Shelter Radiant Heating System (SRHS)	NSRDEC
29	Solid Waste Reduction (Latrine)	NSRDEC
30	Wireless Mesh	CBITEC
31	C-huts	ERDC