



# Defending the Grid

Munitions Response and Energy Security Case Studies from Iraq, Ukraine, and Beyond

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**TETRA TECH**

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# Agenda

- ◆ Introduction
- ◆ Tetra Tech Overview
- ◆ Overview of Munitions Response (MR) Capabilities
  - ◇ Geophysics
  - ◇ Underwater
  - ◇ Demining
- ◆ Intersectional Case Studies: MR/Energy Security
  - ◇ Ukraine
  - ◇ Iraq
- ◆ Questions



# TETRA TECH SNAPSHOT

WORKS IN  
**100+**  
COUNTRIES

**7**  
CONTINENTS

Publicly traded  
on NASDAQ as



**\$4.5 billion**  
ANNUAL REVENUE

WORKS ON  
**100,000**  
PROJECTS

ANNUALLY  
**550** OFFICES  
WORLDWIDE



## ENR RANKINGS

- #1 Water
- #1 Environmental Management
- #1 Water Treatment/Desalination
- #1 Hydro Plants

**22,000** CLIENTS

**27,000** EMPLOYEES

# CONUS Munitions Response Services

- ◆ Site characterizations and removal actions for conventional and chemical munitions
- ◆ Third-party quality assurance
- ◆ Munitions and explosives of concern (MEC) avoidance and unexploded ordnance (UXO) staffing for commercial clients



# CONUS Munitions Response Services



- ◆ DoD Accredited, Advanced Geophysical Classification (AGC); ISO 17025 certified
- ◆ Marine services (UXO diving/underwater geophysics)

# OCONUS Technical Scope and Market Services

- ◆ Humanitarian Mine Action (HMA) (explosive hazard clearance)
- ◆ Strategic and operational support and advice to governments
- ◆ Physical Security and Stockpile Management (PSSM)
- ◆ Munitions risk, management consultancy
  - ◇ Herat International Airport (USAID)
  - ◇ Siemens Europe
  - ◇ UK Foreign and Commonwealth Office, Belize
- ◆ Technical survey and clearance
  - ◇ Various US Embassy sites, Africa and Europe
- ◆ Maritime survey and clearance
  - ◇ Mariana Straights
  - ◇ Culebra, Puerto Rico



# CONUS/OCONUS Munitions Response Projects

PROJECT NAME, DURATION	DESCRIPTION
<b>Rocky Mountain Arsenal</b> 1997–2011	Completed environmental cleanup (CWM, munitions, & explosive of concern) of the former chemical and incendiary weapons and pesticide manufacturing and demilitarization facility
<b>US Army Pueblo Chemical Depot</b> 2016–2019	Located, recovered, managed, and made final disposition of CWM/CA, MEC/MC and HTRW
<b>NTCRA at Former Naval Air Facility Adak</b> 2014–2016	Eliminated hazards associated with MEC in three Remedial Action Areas under the MMRP
<b>Former Lowry Training Area, Non-Time Critical Removal Action</b> 2008–2012	Removed depleted uranium (DU) and MEC and verified the accuracy and adequacy of previously conducted radiological surveys and removals
<b>Former National Fireworks Site, Hanover, MA</b> 2019–2021	Completed investigation and remediation services (Phases I, II, and III) as well as MEC and MPPEH screening and excavation
<b>Culebra Water Ranges</b> 2011–2021	Prepared RI/FS
<b>DOS: Expansion &amp; Sustainment of CWD Program for Northern Syria</b> 2016–2020	Deployed >200 TCNs to survey, mark, and remove ERW at multiple sites; trained 145 LNs to IMAS standards; delivered risk education (MRE); provided all life support, logistics, & security
<b>DOS: Iraq Humanitarian Mine Action</b> 2018–2023	Clear UXO and IEDs from critical infrastructure to enable stabilization and return of IDPs
<b>DOS: Bosnia Weapons Destruction</b> 2018–2023	Destroy ammunition and explosives in support of regional treaty agreements
<b>DOS: Laos HMA Support &amp; Capacity Building</b> 2018–2023	Improving efficiency and effectiveness of GoL in conducting and regulating mine action, UXO clearance, stockpile management and CWD efforts
<b>DOS OBO: CAR, DRC, South Sudan</b> 2020–2022	Cleared area for Embassy expansion and USAID accommodation
<b>Redzikowo Airfield Removal Action &amp; Construction Support, Poland</b> 2014–2021	Performed range clearance and conducted UXO overwatch during military construction

# Tetra Tech's Mission in Ukraine



- ◆ Strengthening Energy Security (USAID)
- ◆ Advancing Transparency in Government (USAID)
- ◆ Creating Safe Ground in Civilian Areas (US DoS PM/WRA)



# USAID Energy Security Project in Ukraine

*Since 2018, Tetra Tech has worked closely with the GoU and US Agency for International Development's (USAID) Energy Security Project (ESP).*

*Partner with institutions to reform Ukraine's energy markets, improve heating services, and integrate its energy sector with Europe.*



# USAID Energy Security Project in Ukraine

- ◆ Support integration of Ukrainian power grid with European system to access markets and promote cross border trade
- ◆ Support development of energy markets to increase competition and improve transparency
- ◆ Facilitate development of efficient, reliable, and sustainable district heating systems
- ◆ Support resilience of Ukraine's gas and electricity sectors during Russia's invasion
- ◆ Support a swift, transparent, equitable, low-carbon reconstruction of Ukraine's energy sector



# Innovative Hybrid Energy Storage: Ukrhydroenergo (UHE)

- ◆ Tandem operation of hydropower turbines with battery energy storage systems (BESS) at five strategic plants
  - ◇ Quick response to the grid
  - ◇ Integrates real-time automated operation and load management
  - ◇ Reduces wear-and-tear on hydro units and cost
- ◆ Solar energy systems
  - ◇ Reduce daytime usage and operational costs
  - ◇ Dniester HPP site - local municipality can provide charging points for electric vehicles
- ◆ Least-cost, “green” solution decarbonizes operations and decreases dependence on energy imports

## A Country at War –

- ◆ When Russia invaded in 2022, Tetra Tech began supporting emergency repair of energy infrastructure to keep the power on in homes, hospitals, and schools
- ◆ Tetra Tech is the procurement agent for the **EU's Ukraine Energy Support Fund**
  - ◇ International, multiple donor pool
  - ◇ Transparent and responsive
  - ◇ Provide critical energy equipment
    - Restore
    - Rebuild
    - Address immediate supply chain issues

# USAID ESP Support Since the Invasion



## 330 GENERATORS

To Ukrainian communities for power generation, heat, and hot water supply and the provision of primary medical and sanitary care for civilians, particularly in damaged areas



## MOBILE POWER STATION (28 megawatts)

To give over 100,000 homes electricity, power, and lights



## Over 46 km STEEL & INSULATED PIPES

Plus, thousands of fittings, valves, and related materials to repair and replace underground heating networks damaged by Russian bombing



## 40 EXCAVATORS

For district heating companies in 30 cities to repair underground infrastructure damaged by Russian bombing



## 3,297 FIRST AID KITS

Plus, 500 sets of personal protective equipment to electricity and district heating technicians and other front-line energy operators working to keep electricity, heat, and gas flowing in Ukraine



## 92 EMERGENCY HEATING SHELTERS

To help protect thousands of citizens this winter with off-grid powered temporary shelters



## STATIONARY BOILER HOUSE

To help schools in the Kyiv region provide heat and hot water to children



## 189 tons INDUSTRIAL SALT

To support Ukraine's energy generation needs and ensure the continued supply of heat and hot water to civilians



# Munitions Response in Ukraine

- ◆ Focus on critical infrastructure
- ◆ Prioritize clearing water, power, medical facilities, schools, and agricultural lands
- ◆ Provide 8 clearance teams
- ◆ Provide 8 EORE teams
  - ◇ Provide explosive ordnance risk education outreach



# Creating Safe Ground in Civilian Areas

- ◆ Train and equip GoU EOD organizations: MoD, SESU, SSTS, National Police
- ◆ Local capacity building – train LNs to IMAS standards
- ◆ Establishment of a temporary training school and create a new joint EOD facility for the GoU
- ◆ Coordinate donors and deconflict requests for equipment and training support



# Tetra Tech Humanitarian Mine Action, Iraq

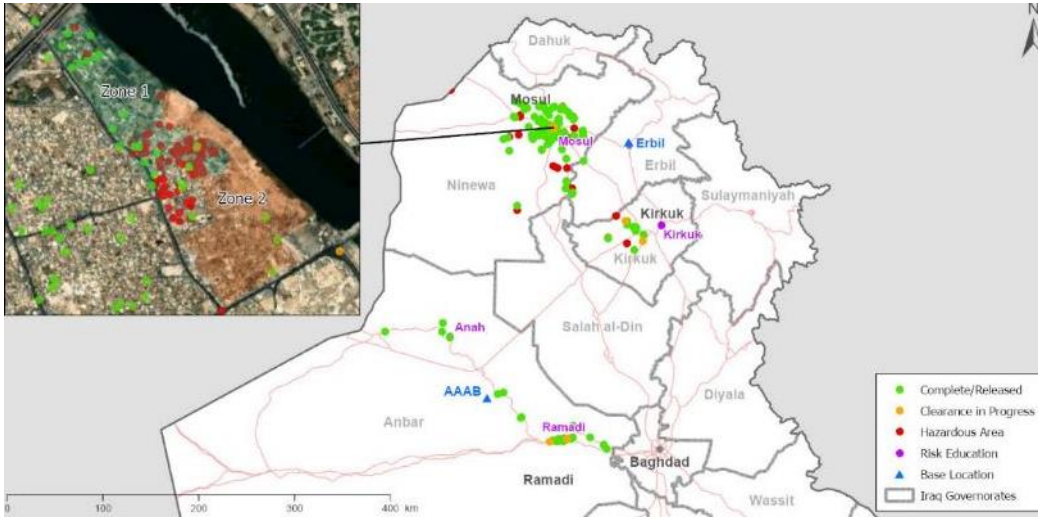


## **US DOS PM/WRA Worldwide Weapons Destructions Support Services (WDSS) (2019–present)**

- ◆ Clear explosive remnants of war from critical infrastructure
  - ◇ 10 demining teams
- ◆ Build local national demining capacity
  - ◇ Advanced counter-IED training
- ◆ Provide explosive ordnance risk education (EORE)



# Accomplishments to Date



- ◆ 323 sites cleared and released
- ◆ 28 million square meters or >7,100 acres
- ◆ 8,347 explosive hazards (not including small arms)
- ◆ Currently clearing Old Mosul, HQ, and the last stand of ISIS



# Mosul Super Grid, Iraq

- ◆ Main 400 kV distribution facility for power generated by the Mosul Dam
- ◆ Severely damaged during liberation from ISIS in the Battle for Mosul
- ◆ Removed 20 explosive hazards
  - ◇ Rockets, 40 mm grenades, IED main charge, 100 mm mortar
- ◆ Supply power to +800k people



# Ramadi Old and New Power Stations, Iraq

- ◆ Occupied by ISIS from 2013–2015
- ◆ Removed 40 explosive hazards
  - ◇ IED main charges, mortars, rockets, and RPGs
- ◆ Supply power to +300k people
- ◆ Intersectionality
  - ◇ Supply power to major water wastewater projects with 500k beneficiaries



***“In Ramadi, clearance of the Justice Palace Water Project helped bring clean water to 50,000 civilians and enabled Al Razi Hospital***

# Turning the lights back on in Al Tameem, Ramadi



# Questions?

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