BECHTEL PARSONS BLUE GRASS
A Joint Venture of Bechtel National, Inc. and Parsons Government Services Inc.

Bluegrass Lessons Learned: Implementing Explosive Destruction Technology at BGCAPP

Blue Grass Chemical Agent-Destruction Pilot Plant

4 June 2015

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Assistant Project Manager (EDT)

Agenda

- **Explosive Destruction Technology (EDT) Differences from the Anniston Unit**
- **Lessons Learned Incorporation**
- **EDT Facility / Components**
- **EDT Schedule and Milestones**
- **Summary and Questions**

More History

- **Request for Proposal was sent to pre-qualified bidders in October 2012**
- **Proposals were received in December 2012**
- **Record of Decision in October 2013**
- **Contract awarded after completion of commercial and technical evaluations in November 2013**

Anniston SDC EDT System

Static Detonation Chamber (**SDC**):

- Hot Detonation Chamber
- A double-walled steel detonation chamber
- Off-gas treatment system
- No donor explosives required, minimal handling and minimal exposure to explosives
- System heats the projectile's energetic above its auto-ignition temperature to destroy the munitions

Shown is the Anniston SDC Facility

Explosive Destruction Technology Unit Differences (Anniston vs. Blue Grass Chemical Agent-Destruction Pilot Plant)

Location:	**Anniston**	**BGCAPP**
Description	SDC 1200 CM (Chemical Mobile) Transportable unit	SDC 1200 C (Chemical) Fix Facility unit
CW Net Explosive Wt. (NEW)	2.2 lb High Explosive (1.0 kg) Hazard Class 1.1	6.63 lb HE (3.0 kg) HC 1.1
Fragment Shield:	Tube Shaped (sides only)	Bowl Shaped (sides with a bottom)
Detonation Chamber (DC) Heater:	3 on the bottom of the DC	3 on the bottom plus additional on sides
Cooling Fan for Locking Ring:	None	Yes (added to minimize binding at high temps.)
Loading Chamber (LC)1 and LC2 Vents to THO: (to minimize/prevent agent migration to the Process Ventilation)	No	Yes
Bypass valve around off-gas orifice: (to minimize press in the chamber to minimize agent migration to LC2)	No	Yes
Off-Gas Treatment System (OTS):	Has a SDC 1200 sized OTS	Has a larger SDC 2000 OTS (75% larger)
Thermal Oxidizer (THO):	162 ft^3	321 ft^3 (98% larger)
Bleed Water Tank:	No	Yes (added to support 24/7 operations)

EDT Unit Differences (Anniston vs. BGCAPP) cont'd

Location:	**Anniston**	**BGCAPP**
Chiller to remove Condensate:	No (collection pump to recycle H2O)	Yes (added after the Neutral Scrubber)
Re-Heater after Chiller:	None initially – installed later	Included
Carbon Filter System:	IONEX CD2000	IONEX CD4000
Building Type:	Sprung Structure	Steel Building
Building HVAC:	No - Portable AC unit added	Yes
Cascading Ventilation System:	No- Vapor containment only	Yes (with Category A, B, C, and D areas)
Number of Mustard Projectiles:	2,737 CW munitions processed	Approx.16,000 munitions to be processed
Agent Types:	HD and HT Mustard	H Mustard (with solids)
DOT Bottles:	None processed	Two (2) are planned

Key Design Elements in the BGCAPP EDT Design

- **Over 130 Lessons Learned from the Anniston unit reviewed and incorporated (design and into Standard Operating Procedures):**

Motor Over-load Protection	Condensate Control
Testing of Feed Process Indicators (FPI)	Piping Inspections
Improvement in Maintenance practices	Rapid depletion of IONEX carbon filters
Adding Bag House Shaker	Bag House Lid Redesign
Adding a Mass Flow Assembly	Install a Process Bleed Water Tank
Spray Dryer Nozzle Clogging	Pressure equalized between Loading Chamber (LC) 1 & LC2
Buffer Tank Knife Valve Leakage	Agent Migration from LC2
Process Water Strainers	Additional Closed-Circuit TV (CCTV) Cameras
Removal of LC 2 Cover (decon)	Cleaning and Inspection Off-Gas Piping
SDC Chamber Seals	SDC Gate Seals

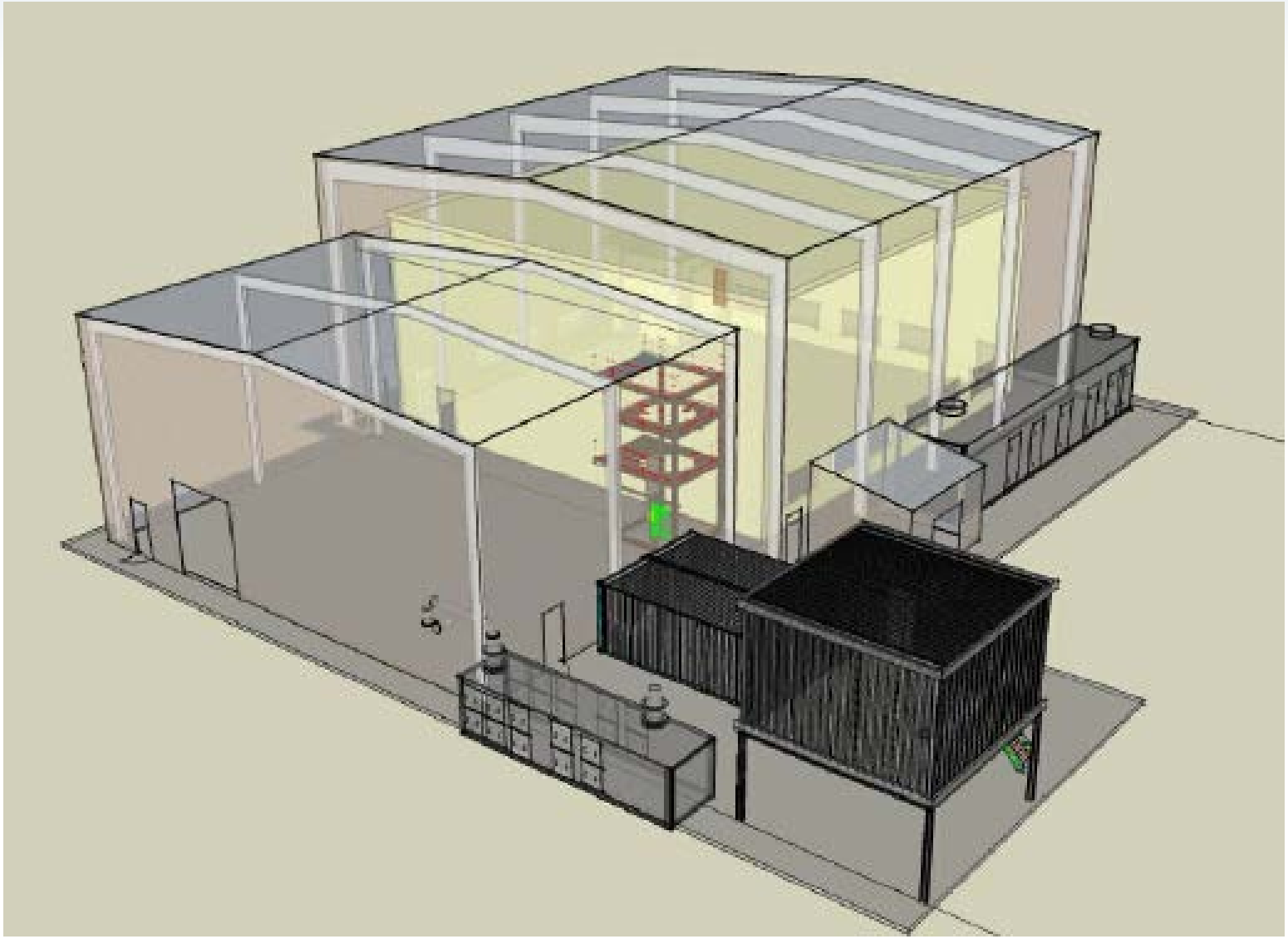
- **Building Design:**
  - Heating Ventilating and Air-Conditioning System
  - Vapor Containment Areas (A / B / C / D areas)
  - Cascading Ventilation System

- **Chiller to remove condensate followed by a Re-Heater to reduce moisture to the process Carbon Filter unit and to the Stack**

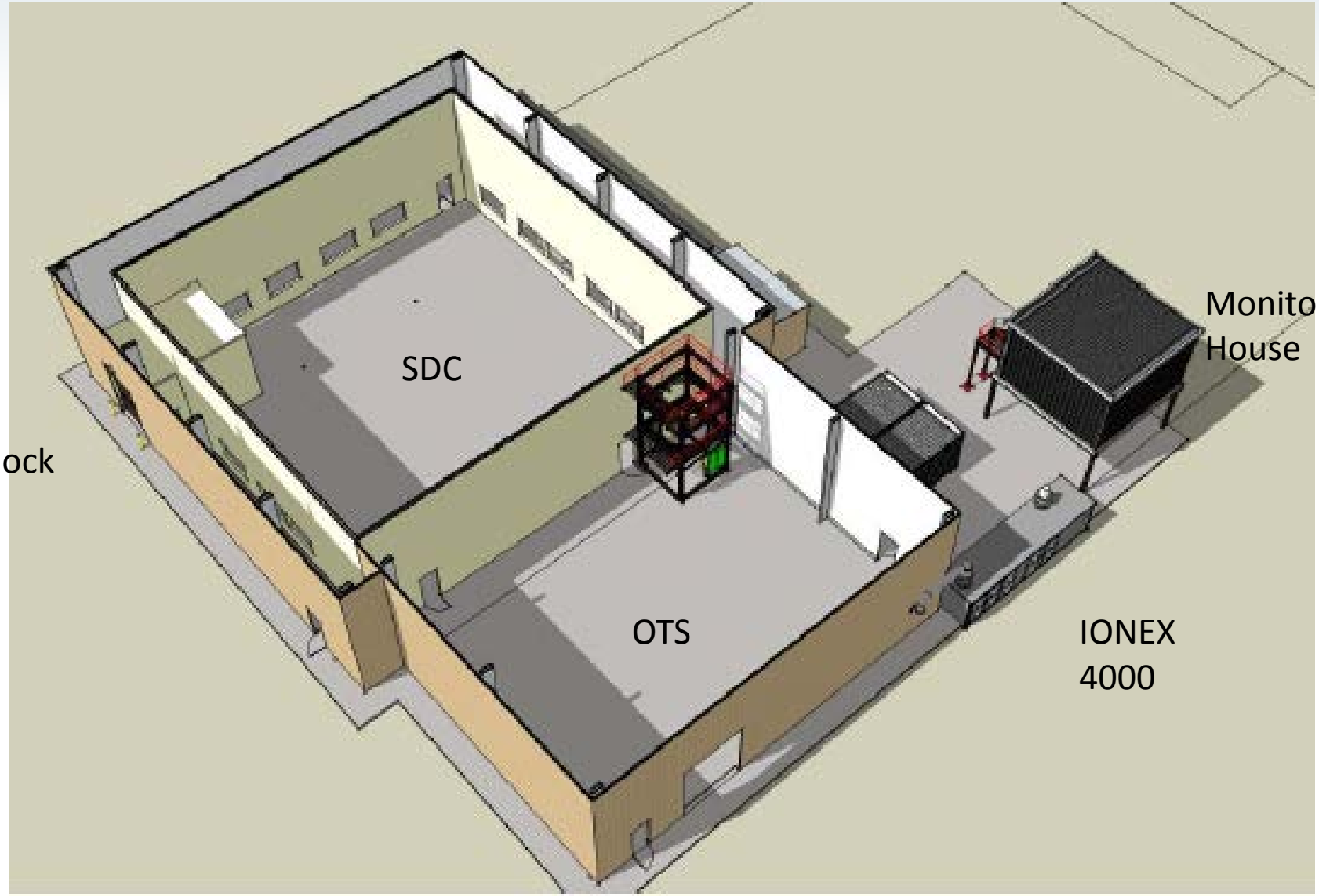
BGCAPP Facility Design Description

- **The Explosive Destruction Technology (EDT) Enclosure Building consist of a 77 X 120 foot building (approx.).**
- **The building has an A, B, C, D Agent Areas with a Cascading Ventilation System and a Munitions Delivery Vestibule.**
- **The Static Detonation Chamber consist of a:**
  - Loading Conveyor and Elevator Lift
  - Loading Chamber #1 and #2
  - The Detonation Chamber (DC)
  - A Buffer Tank
  - A Scrap Chute, Scrap Cooling Conveyor, Belt Conveyor, and a Scrap Bin
- **The Off-Gas Treatment System (OTS) consist of a:**
  - Thermal Oxidizer
  - Spray Dryer
  - Bag House Filter
  - Quench
  - Acid & Neutral Scrubber
  - ID Fans
  - Heat Exchanger and Cooler
- **The building has a 16,000 CFM IONEX Filter Unit and the OTS has a 4,000 CFM unit**

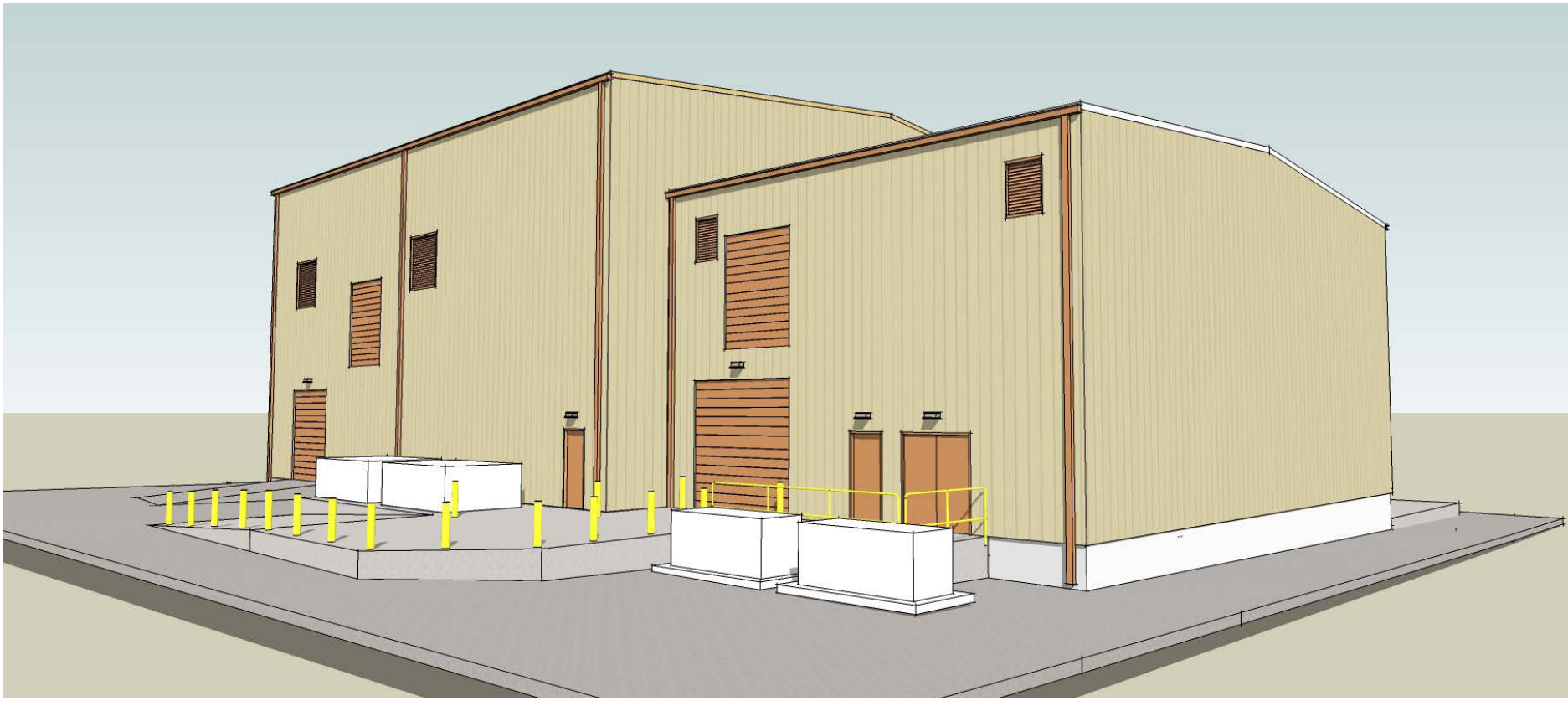
EDT Enclosure Building (EEB)



EDT Enclosure Building (EEB)



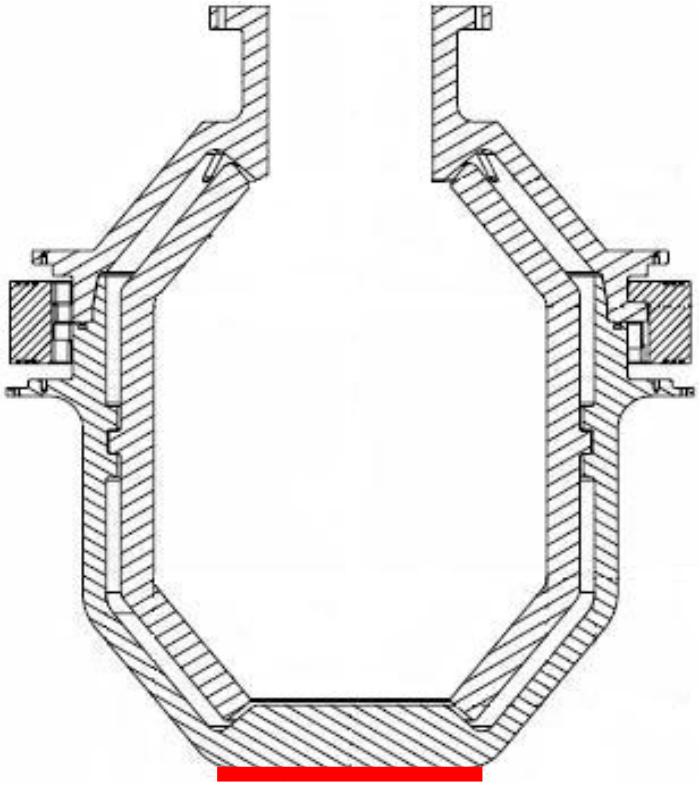
EDT Enclosure Building (EEB) Layout



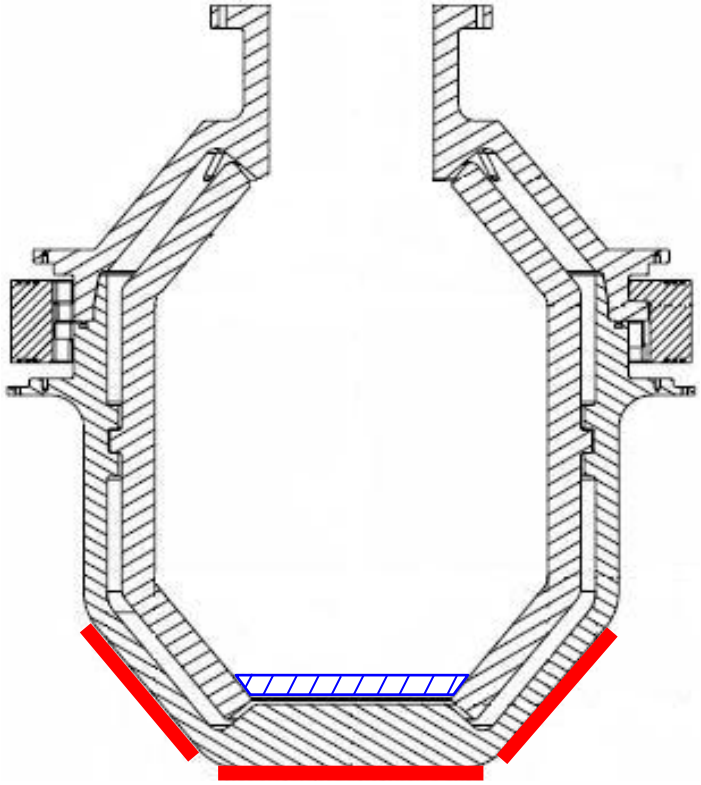
Updated EEB exterior design (view from the SW side)

Detonation Chamber (DC)- Key Design Elements

- Additional Heaters on the Sides of the Detonation Chamber
- Liner has a Fully Closed Bottom (bowl type vs. open tube type)

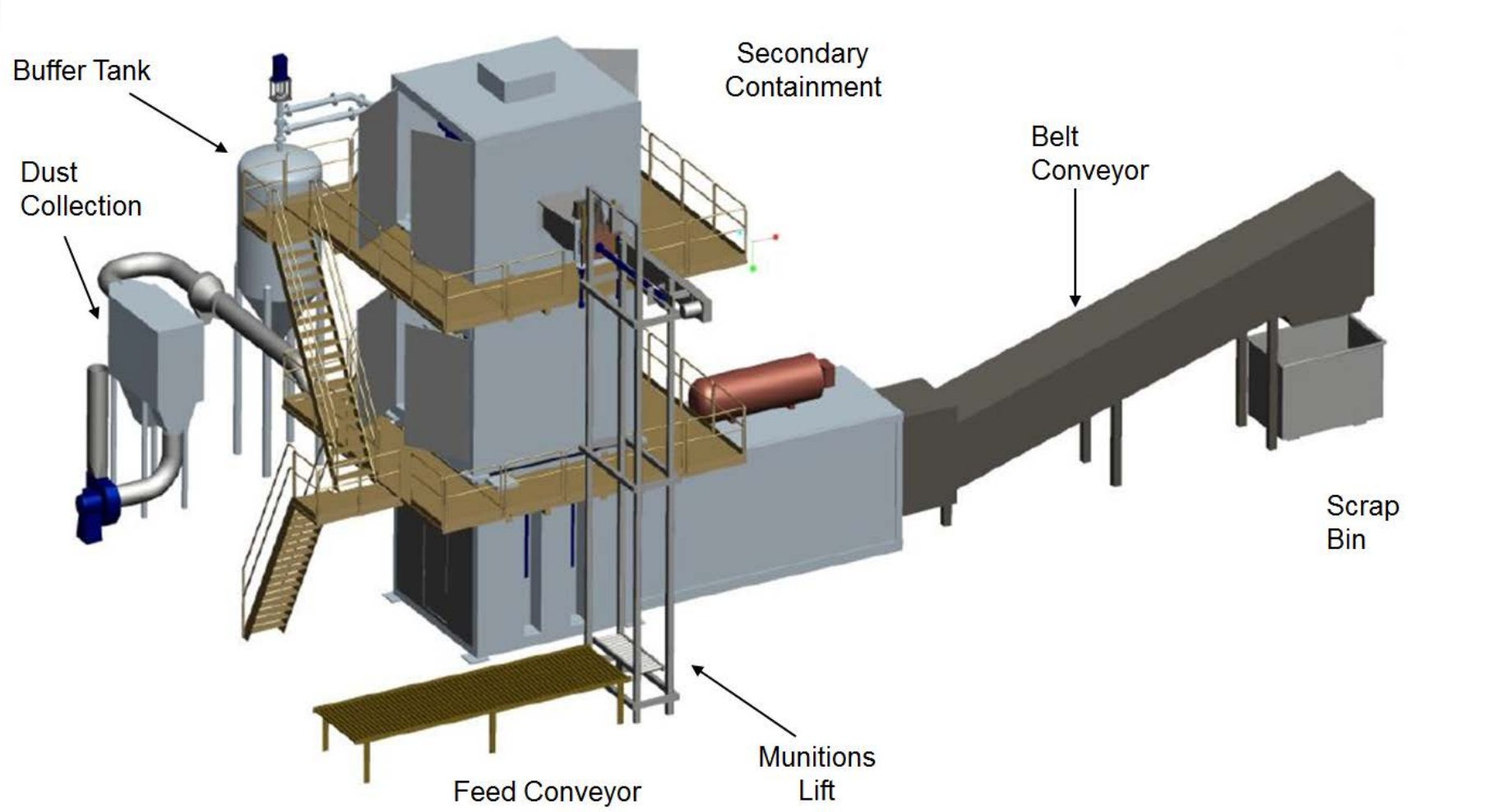


Anniston DC Unit

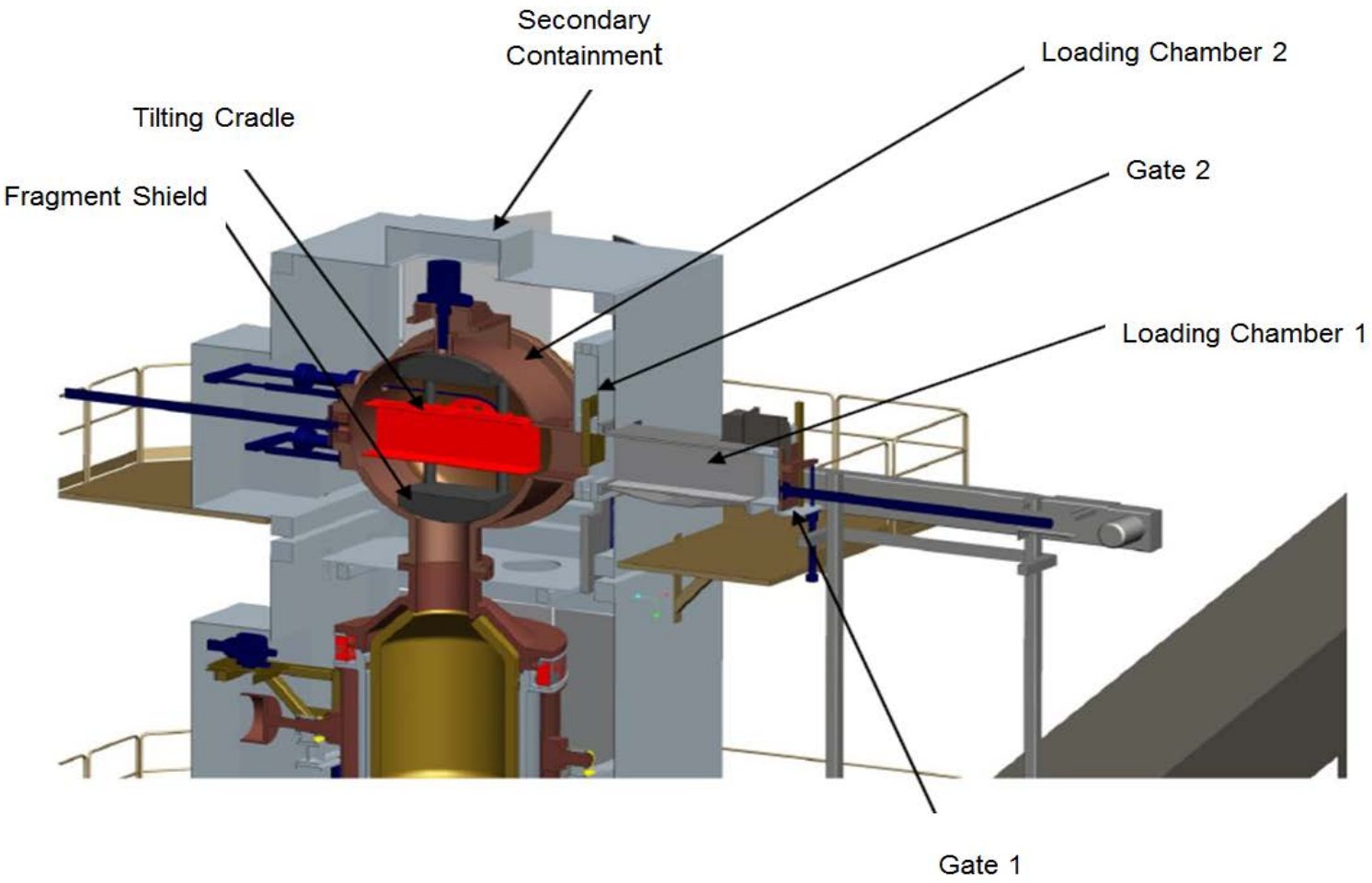


BGCAPP EDT DC Unit

EDT Process Equipment Layout



EDT Process Equipment



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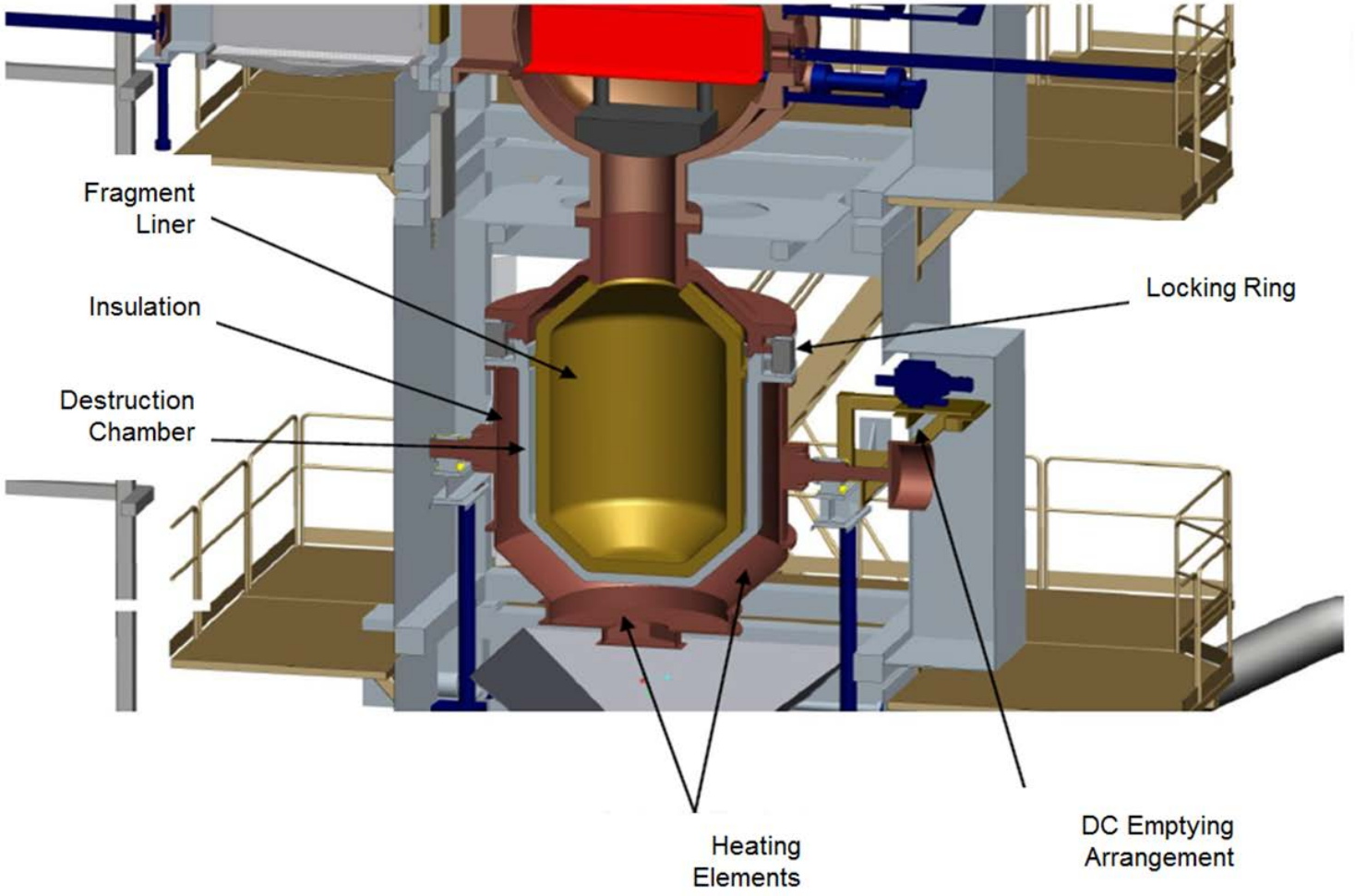
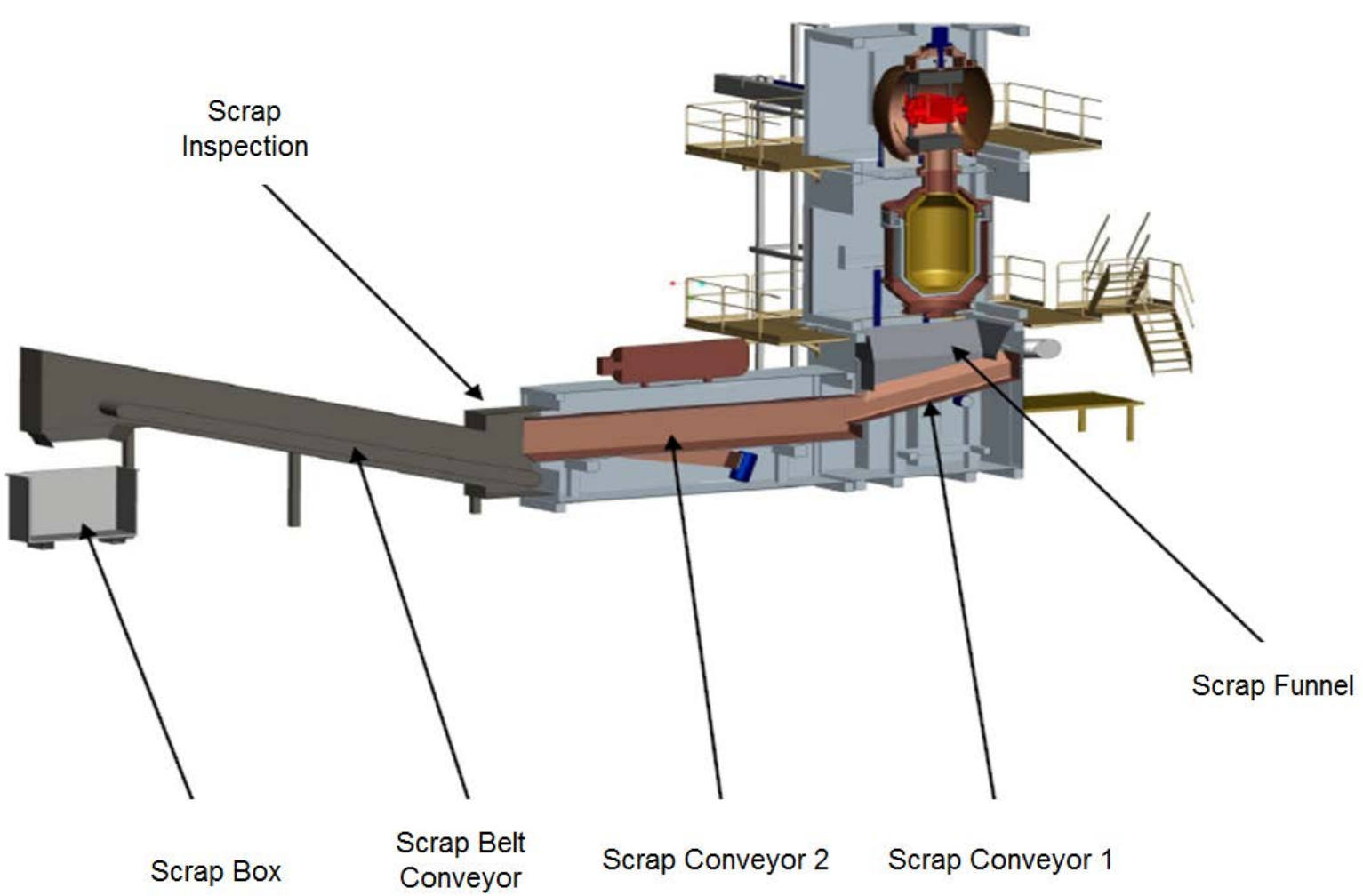
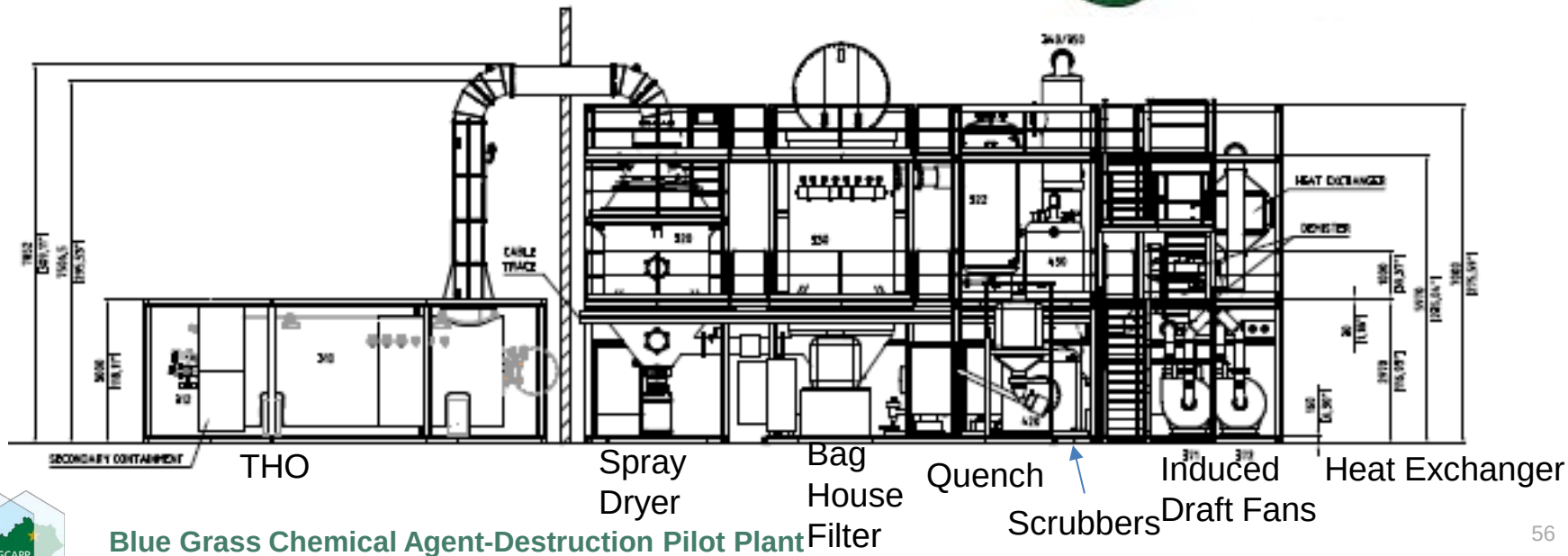


EDT Process Equipment

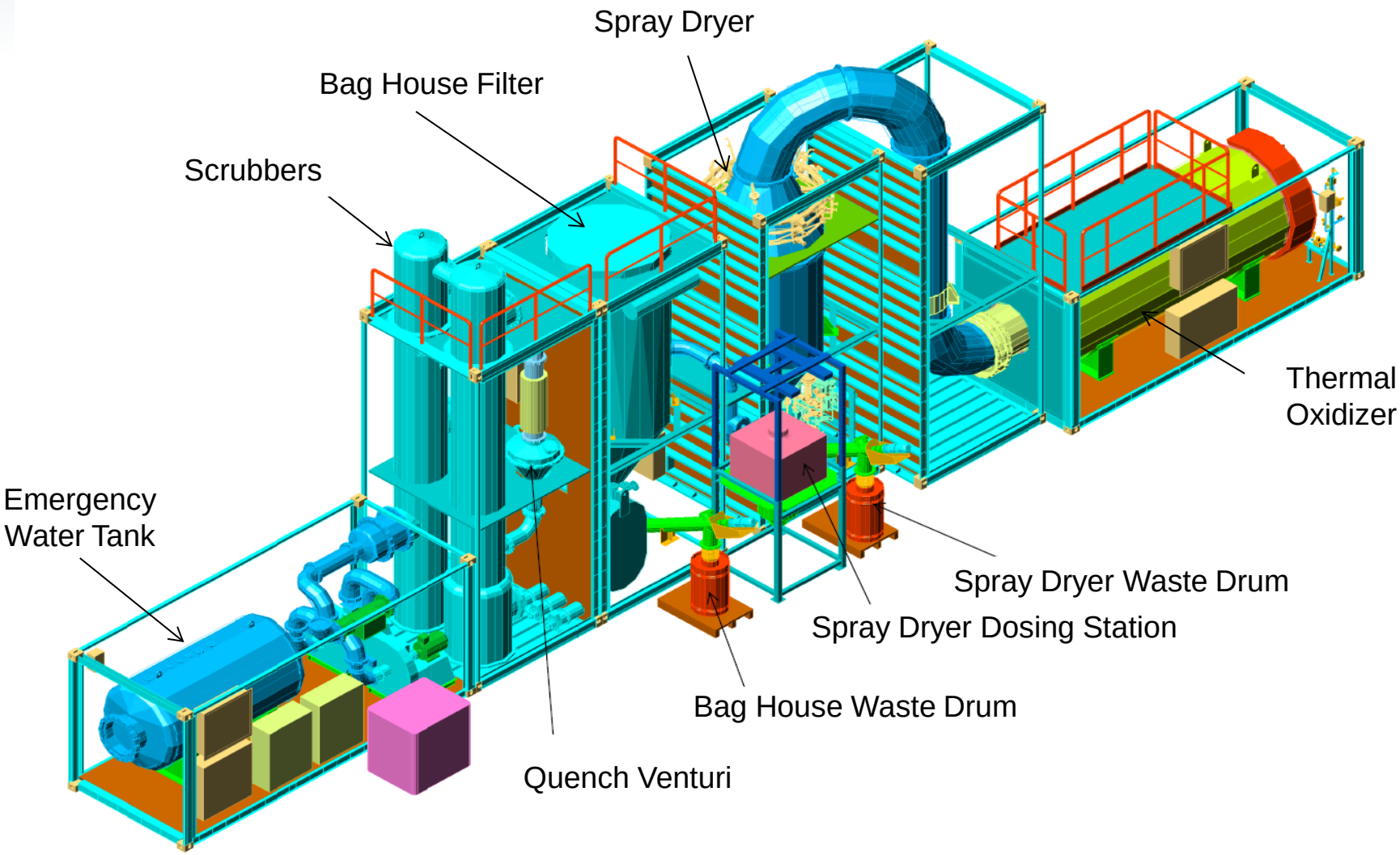


Off-Gas Treatment System (OTS) - Key Design Elements

- **Upgraded / Larger Thermal Oxidizer (THO) & OTS**
  - Limiting Throughput (Pacing Station) for the Anniston unit
- **The THO is 98% larger:**
  - Anniston unit is: 162 ft^3
  - BGCAPP unit will be: 321 ft^3
- **The OTS is 75% larger**
- **Closed Loop Process Water System**



Off-Gas Treatment System Process Equipment Layout



BGCAPP EDT system in Dynasafe workshops (Current)

EDT Working Schedule and Key Milestones

EDT Technical Readiness Review (TRR)	May 2015
Factory Acceptance Test (FAT)	May - June 2015
SDC Disassembled/Shipped	July- August 2015
Delivery of SDC Unit	August 2015
Site Acceptance Test (SAT)	May 2016
EDT Construction Complete	November 2016
EDT CW Operations	March – December 2017
EDT Closure and Turn-Over	December 2017 - June 2018

Summary

- The proposed action is to deploy and operate specialized EDT equipment for the safe and timely destruction of all the mustard-filled 155mm projectiles and two DOT bottles currently being stored at BGAD in an environmentally-acceptable and cost-effective manner.
- The Army proposes to construct and operate an EDT facility within the boundaries of BGAD to augment the planned operation of BGCAPP and to address the agent solidification issues expected to be encountered during the processing of the mustard-filled munitions.
- Before the first nerve agent destruction operations begin at BGCAPP, it is planned that the EDT Facility will process all of the mustard-filled items.
- The BGCAPP Project is committed to continuing our partnership with the local stakeholder community to ensure safe destruction of the entire chemical weapons stockpile.

Questions?