Oak Ridge National Laboratory:

The IFDP and impacts from the American Recovery and Reinvestment Act

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U.S. DEPARTMENT OF ENERGY

OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

Oak Ridge National Laboratory evolved from the Manhattan Project

ORNL in 1943
The Clinton Pile was the world's first continuously operated nuclear reactor

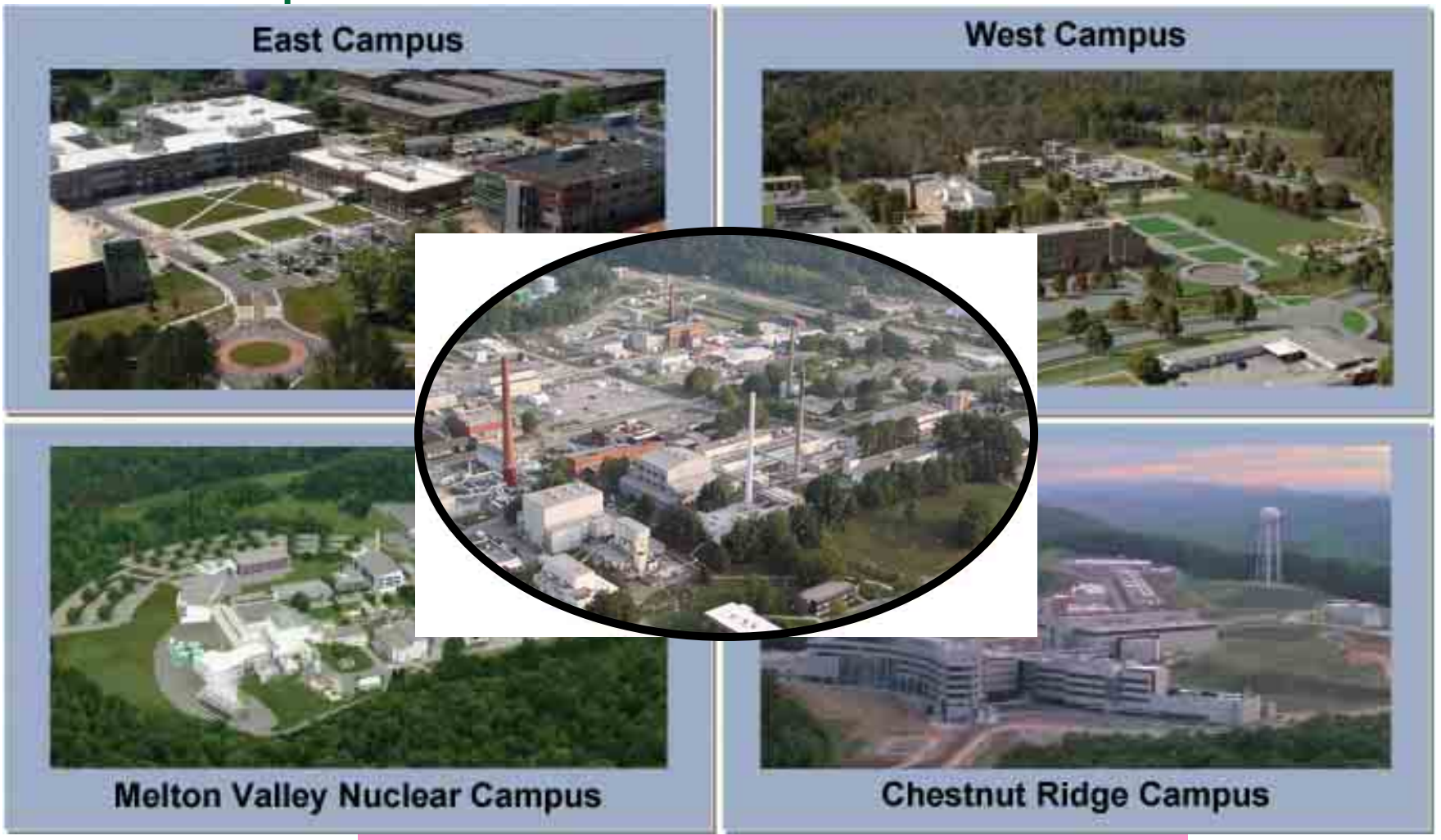
Today, ORNL is DOE's largest science and energy laboratory

- $1.36B budget
- 4,400 employees
- 3,900 research guests annually
- $350 million invested in modernization

- World's most powerful open scientific computing facility
- Nation's largest concentration of open source materials research

- Nation's most diverse energy portfolio
- Operating the world's most intense pulsed neutron source & highest flux research reactor
- Managing the billion-dollar U.S. ITER project

Modernization has changed the ORNL landscape



But Central Campus remains a blight

- **Risk to staff and mission**
- **Excess materials and facilities**
- **Area needed for S&T Park**

IFDP Represents a Complex Scope of Work at ORNL

Scope of work

- Treatment and disposition of legacy materials and waste
- D&D 327 (1.5 M ft^2) excess facilities generating >2 M yd^3 debris
- Soil and groundwater remedial actions generating >1 M yd^3 soils
- Reconfiguration of waste management facilities
- Ongoing waste management operations
- Ongoing facilities surveillance and maintenance
- Project management & site integration

Plan Remediates Legacy Facilities in Central Campus

Examples of Legacy Material

Radioisotope Thermoelectric Generator (RTG) – 700,000 Ci Sr-90

Shielded Transfer Tanks (STTs) – used to transport isotopes from Hanford to Oak Ridge

9'x9'x9' concrete vaults used to store legacy RH waste

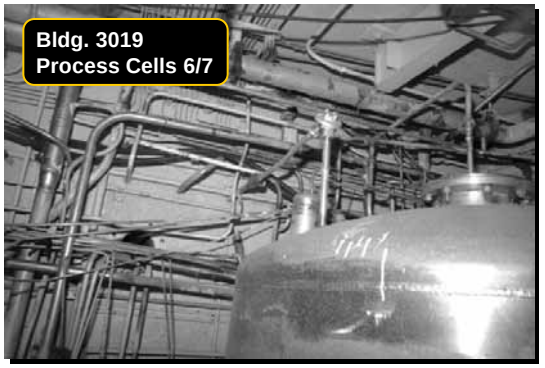
Material in HFIR pool – activated reactor components like beryllium reflector, 1M R control plates, bearings, etc.

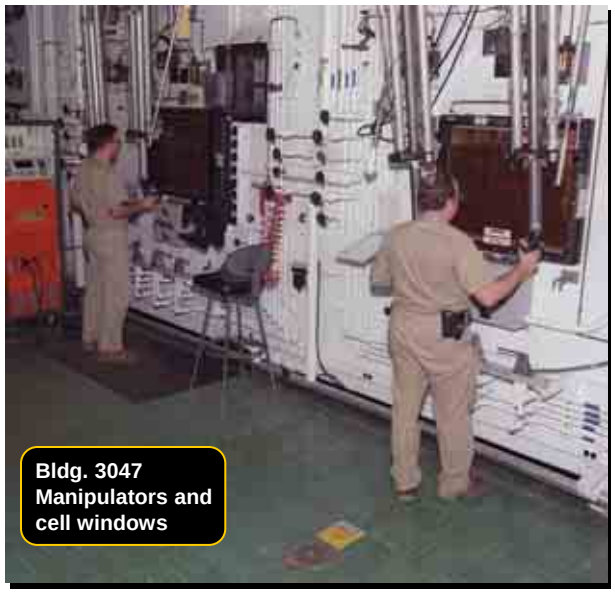
Mark 42 target located at REDC – the target s are the source of heavy elements used for research and isotope production

Curium capsule located at REDC – Curium is used to fabricate targets that are irradiated in HFIR for isotope production

IFDP RH Hot Cell Waste

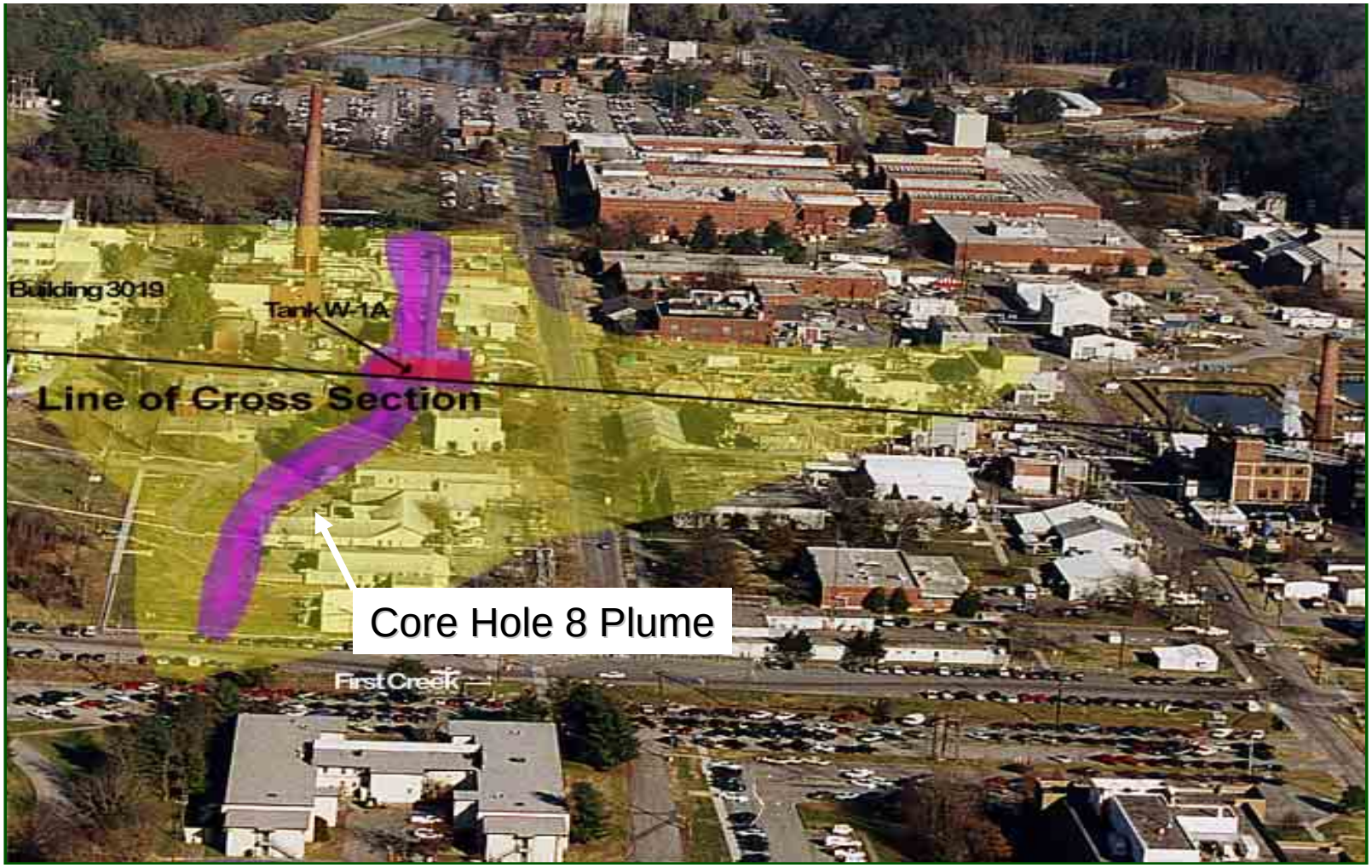
- 18 hot cell facilities to be D&D (129 hot cells)
- Total cell volume is ~200,000 ft^3
- Radioisotope contamination levels vary from facility to facility but interior surfaces of all cells are above RH dose levels
- Manipulator cells contain RH equipment and solid debris
- Processing cells contain piping, valves, and vessels with solid and liquid heels
- Examples
  - 129 equipment items
  - 121 cell windows
  - 209 manipulators





D&D will produce >350,000 yd^3 of debris for disposal at on-site landfill and CERCLA disposal cell

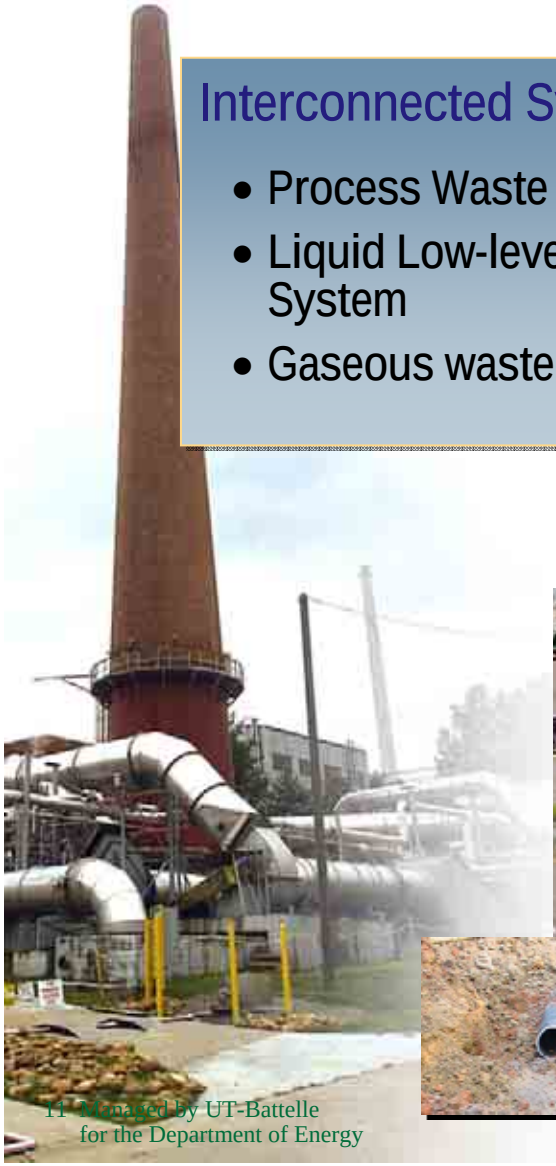
Remedial action will generate > 57,000 yd^3 of soils



Continued operation of old waste treatment facilities with eventual D&D

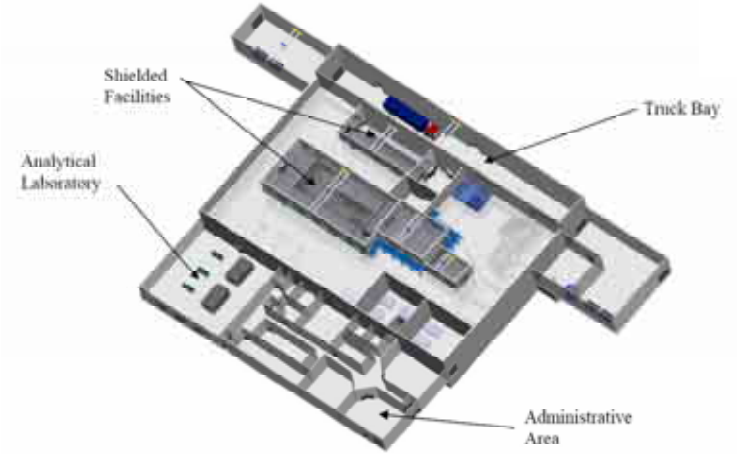
Interconnected Systems:

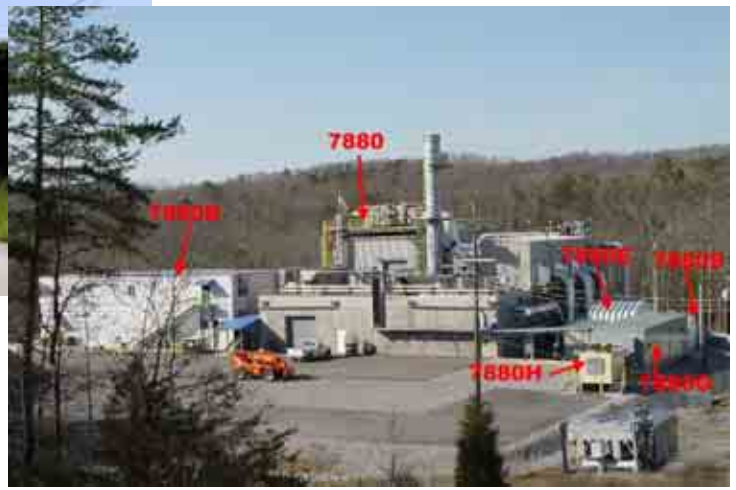
- Process Waste System
- Liquid Low-level Waste System
- Gaseous waste system



Design & reconfigure waste infrastructure sized to meet IFDP and future ORNL waste requirements

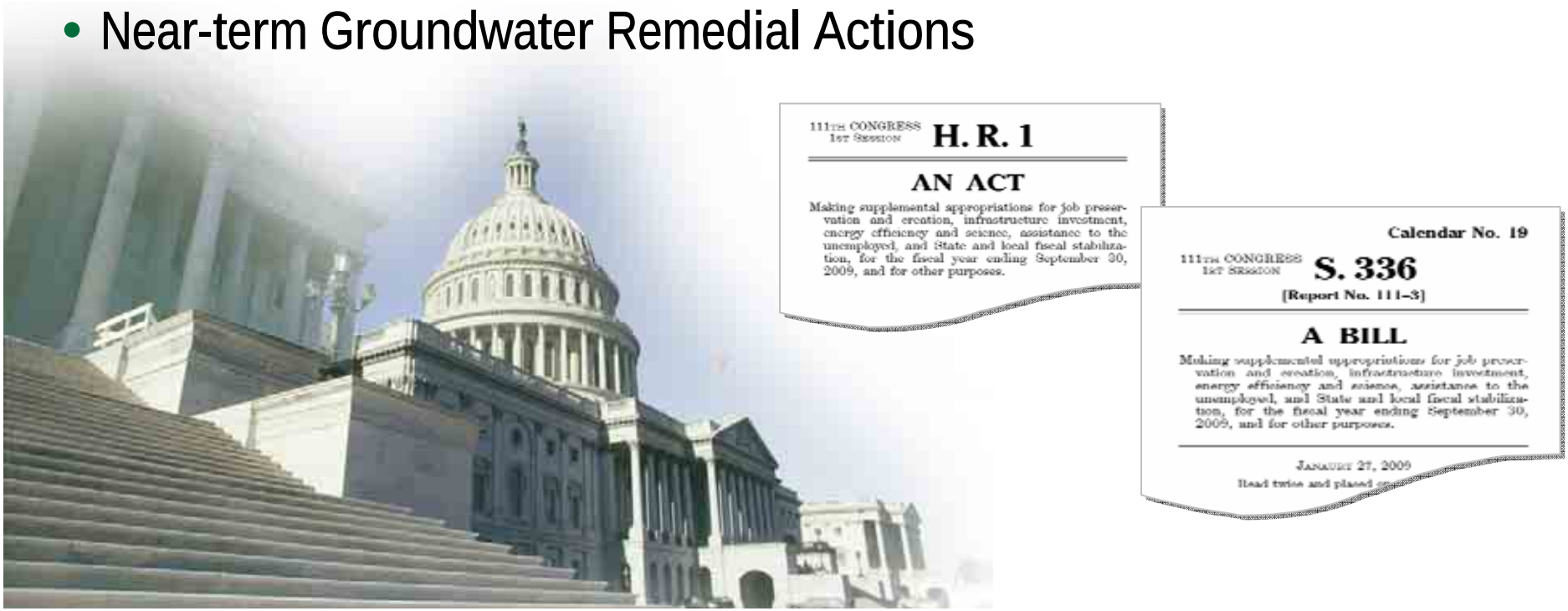
- Groundwater treatment facility for Main Campus
- Liquid Low-level waste system in Melton Valley
- Small, localized gaseous treatment capabilities
- Solids CH and RH-waste staging and storage facilities
- RH solids processing capability

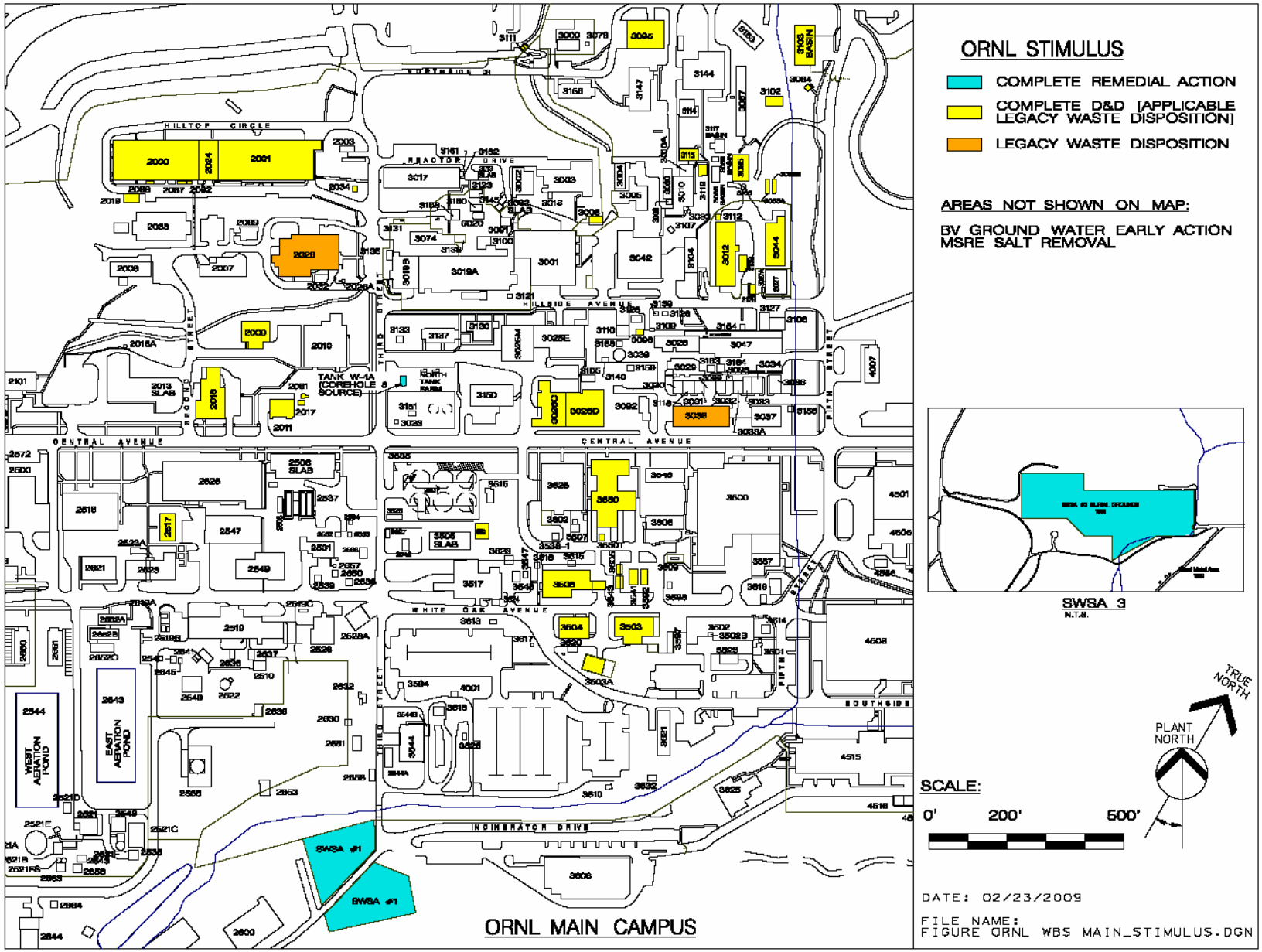


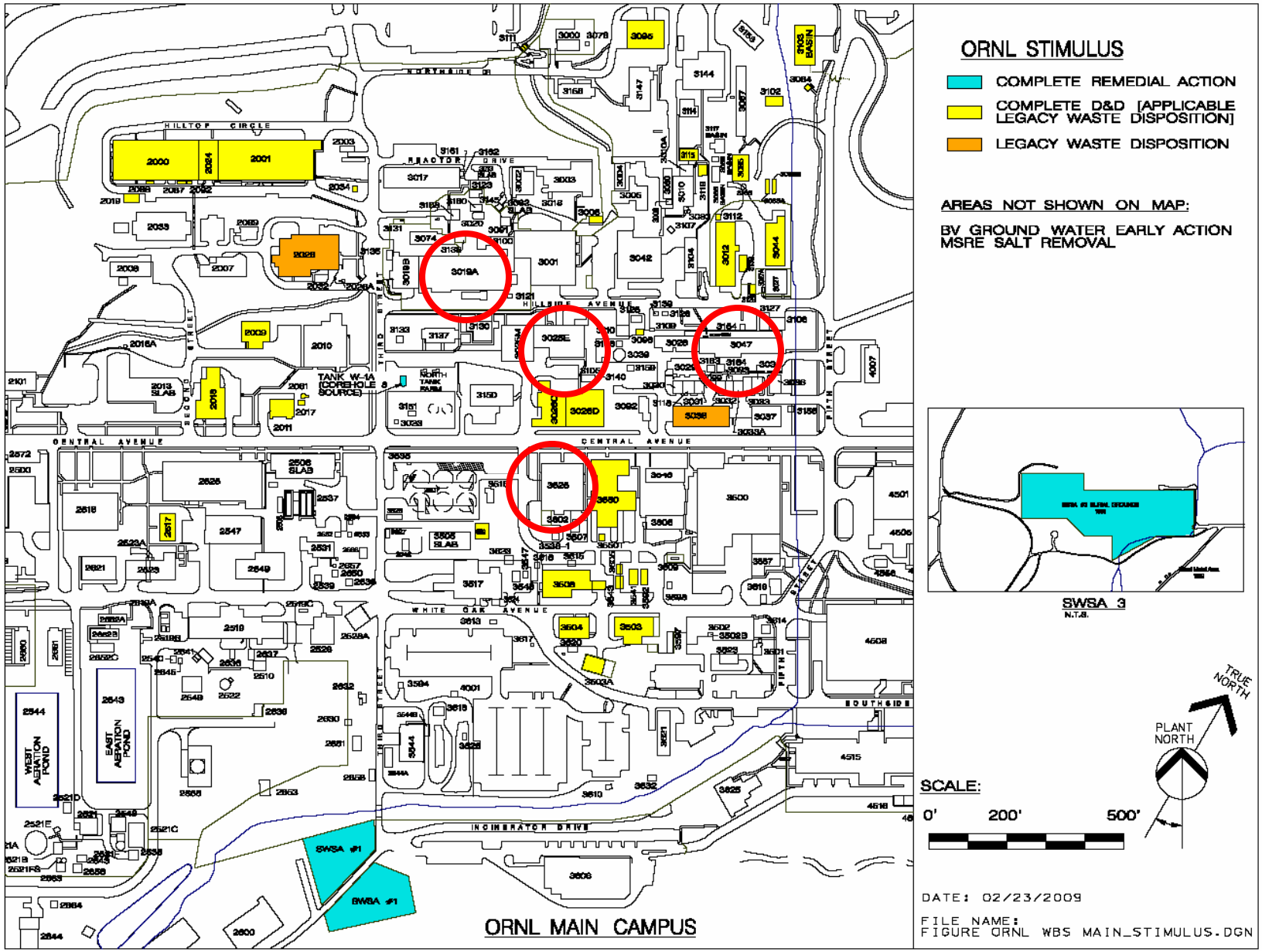


ARRA: Major Impacts on IFDP Near-term Baseline for ORNL

- Completes clean-up and D&D of ~28 facilities located in Central Campus
- Core Hole 8 remedial action
- Molten Salt Reactor Experiment Salt Removal
- Capping of Solid Waste Storage Areas #1 and #3
- Near-term Groundwater Remedial Actions




ORNL STIMULUS
COMPLETE REMEDIAL ACTION
COMPLETE D&D [APPLICABLE LEGACY WASTE DISPOSITION]
LEGACY WASTE DISPOSITION
AREAS NOT SHOWN ON MAP:
BV GROUND WATER EARLY ACTION
MSRE SALT REMOVAL
SWSA 3
N.T.S.
TRUE NORTH
PLANT NORTH
SCALE:
0'
200'
500'
DATE: 02/23/2009
FILE NAME:
FIGURE ORNL WBS MAIN_STIMULUS.DGN
ORNL MAIN CAMPUS
SWSA #1
SWSA #1
WEST AERATION POND
EAST AERATION POND
TANK W-1A (CORE-HOLE 5 SOURCE)
CENTRAL AVENUE
WHITE OAK AVENUE
INCINERATOR DRIVE
HILLTOP CIRCLE
REACTOR DRIVE
NORTHSIDE
HILLSIDE AVENUE
SOUTHSIDE
SECOND STREET
THIRD STREET
FIFTH STREET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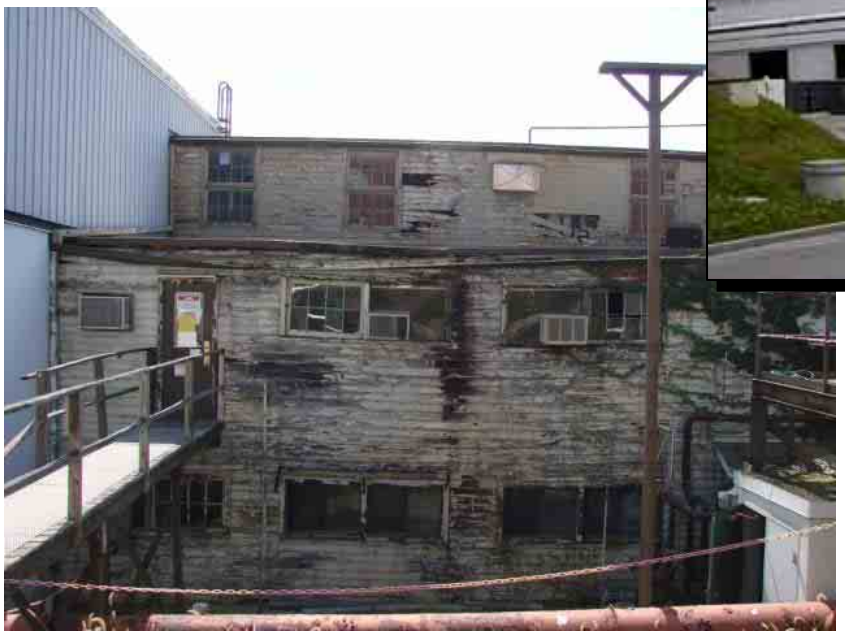
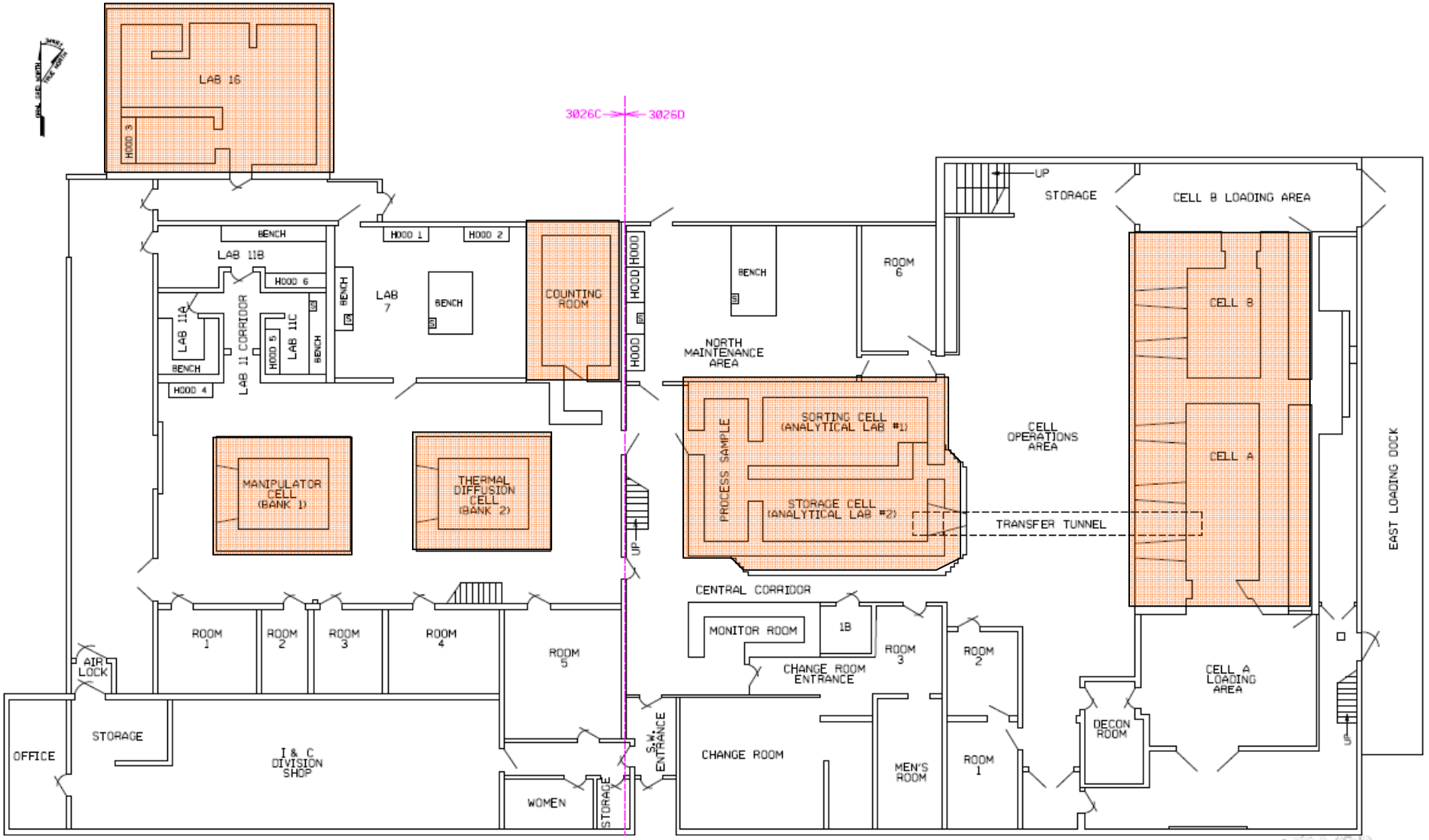
Building 3026 Demolition – Phase 1 includes stabilization and wooden structure D&D



Building 3026 Demolition – Phase 2 includes D&D of the Hot Cells



D&D of the 2000 Complex

- Radiological contamination
- Lead, Asbestos, PCB's
- Beryllium

D&D of Small Facilities, General Maintenance Facilities, & Contaminated Labs Complexes

Legacy Materials Clean-out at Buildings 3038 and 2026

2026 – Radioactive Materials Analytical Laboratory

3038 – Radioisotope Laboratory, Alpha Handling Facility

In Summary: Site Challenges

- Congested Central Campus with ongoing missions in very close proximity
- Site access is limited to Bethel Valley Road
- Interface with site operations
  - Main ORNL thoroughfare (Central Ave) runs down middle of closure area
  - Ongoing mission work while cleanup is underway
- Radioactive materials
  - Wide variety in various forms
  - High rad, high concentrations
- Hazardous materials
  - Lead, asbestos, PCB, mercury, chemicals
  - Beryllium

Oak Ridge National Laboratory:
Meeting the challenges of the 21st century

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