

U.S. DEPARTMENT OF ENERGY  
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

**NUCLEAR WASTE TECHNICAL REVIEW BOARD  
FULL BOARD MEETING**

**SUBJECT: RETRIEVABILITY**

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**PRESENTER'S TITLE  
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# Retrievability is a Program Requirement

**10CFR60.111(b)(1) reads, in part:**

**“The geologic repository operations area shall be designed to preserve the option of waste retrieval throughout the period during which wastes are being emplaced and, thereafter, until the completion of a performance confirmation program and Commission review of the information obtained from such a program.”**

# Retrievability Issue

- **Development of the retrieval strategy (e.g. how easy do we want retrieval to be?)**
- **Development of credible off-normal scenarios for retrieval**
- **Development of equipment and concept of operation design to perform off-normal retrieval operation**
- **Development of scenarios for retrieval for reasons of recovery of resources**

# **Retrievability Issue**

(Continued)

## **Additional Issues**

- **The characteristics of the emplaced waste packages (heat and radiation output) produce a hostile subsurface environment**
- **The waste heat output and the long duration of the retrievability period place demands on the emplacement drift fixtures and ground support designs**
- **The waste packages to be retrieved can weigh over 60,000 kg**

# Impacts of Retrievability Issue on Design

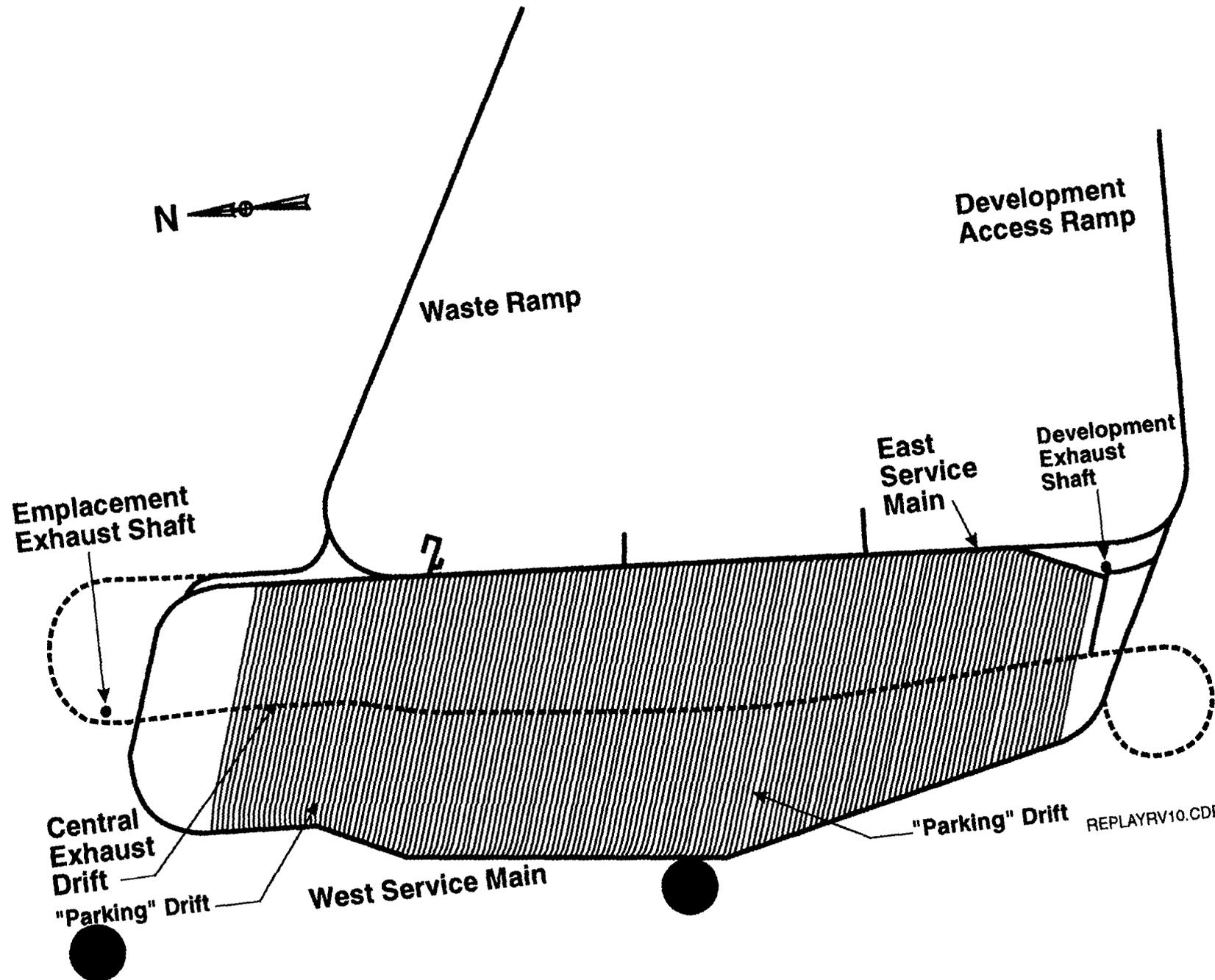
- **Design areas impacted**
- **Subsurface layout**
- **Emplacement mode**
- **Emplacement equipment**
- **Ground support**
- **Ventilation system**
- **Retrieval equipment**
- **Surface facilities**

# **Recent Activities for Closure of Retrievability Issue**

**Addition of central exhaust main and provision for waste handling operations from east and west ends**

- **Halves the length of emplacement drift that must be contended with during retrieval operation**
- **Halves the number of waste packages to be retrieved from each drift**
- **Shortens the cool-down time prior to re-entry**
- **Alternatively, lowers the airflow quantity required to effect cool-down**

# Current Repository Layout

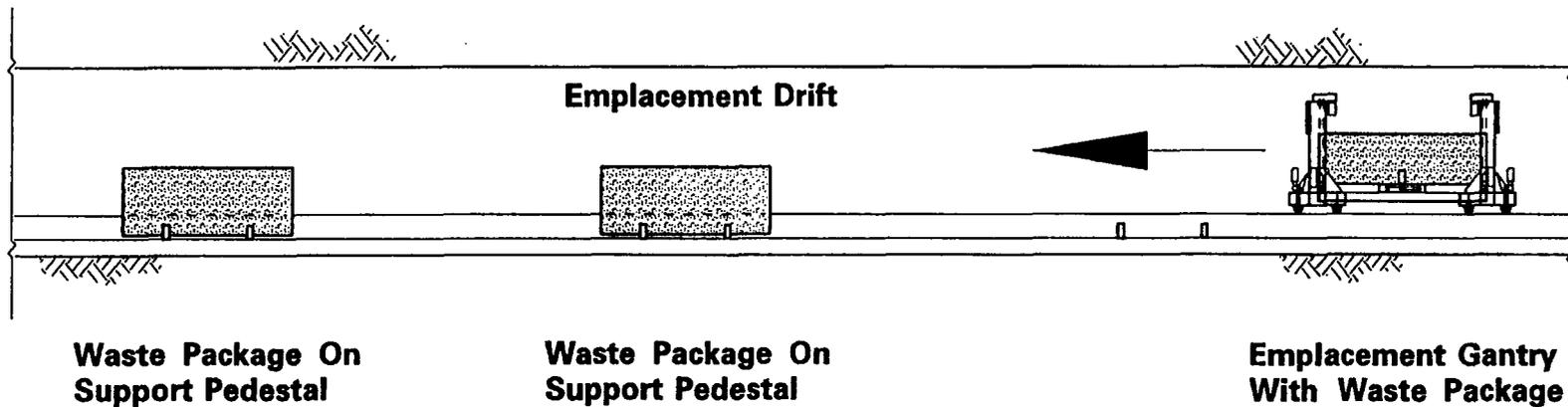


# **Recent Activities for Closure of Retrievability Issue**

(continued)

- **Move to gantry/pedestal emplacement method**
- **Replaces emplacement rail cars with pedestals**
- **No “moving parts” in the emplacement drift environment**

# Gantry Transporting Waste Package



# **Recent Activities for Closure of Retrievability Issue**

**(Continued)**

**Move to full-lining ground support concept**

- **Reduces the likelihood of off-normal retrieval conditions caused by ground conditions**

# **Recent Activities for Closure of Retrievability Issue**

**(Continued)**

- **Engineering studies are being conducted during FY97 to develop further the strategy and requirements for retrieval**
- **Design basis events analyses are being conducted to develop credible off-normal events and scenarios for retrieval**
- **Engineering analyses are being performed to further develop equipment and operational concepts to address off-normal retrieval**