

---

# *Integration of EM Activities at the INEL*

*June 6, 1995*

*National Waste  
Technical Review Board*



# What Was Accomplished

---

- Achieved an integrated solution for INEL EM activities
- Developed an analytical tool to evaluate alternatives
- Result – does more, life cycle costs less

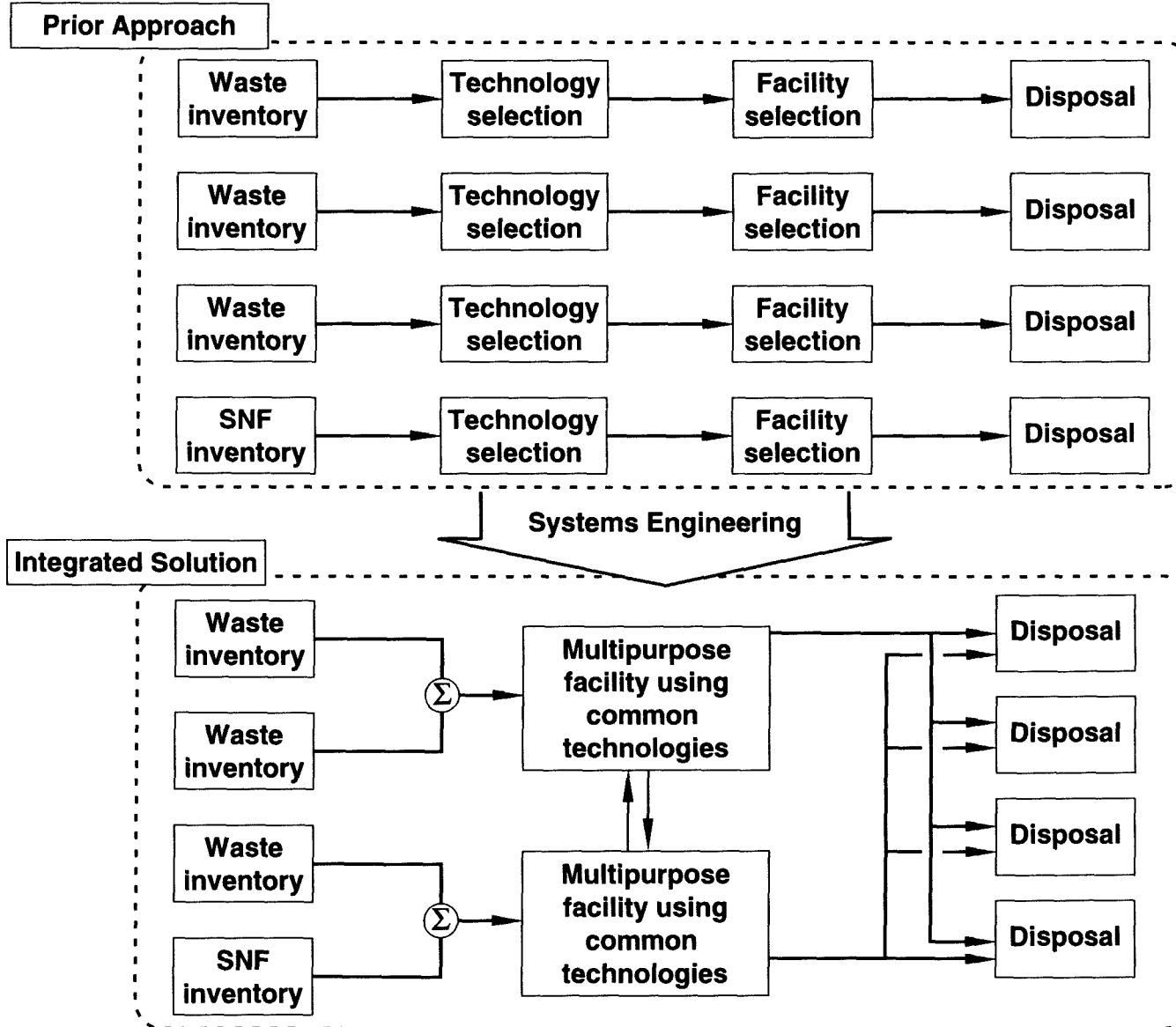
# Governing Criteria

---

---

- **Address budget realities while meeting environmental regulations**
- **Achieve real, measurable results**
  - **Road ready waste, ready for disposal**
- **Integrate ES&H risk into the evaluation**
- **Address stakeholder concerns**
  - **Expeditious site cleanup**
  - **Move waste out of Idaho**

# EM Integration Through Systems Engineering



# What Alternatives Did We Consider

---

---

- **Baseline**
  - Treatment plan elements provided as input for **Baseline Environmental Management Report**
- **Full treatment**
  - Maximizes volume reduction and stabilization
  - Minimizes characterization and repackaging
- **Minimal treatment**
  - Allows characterization/repackaging as an option to treatment
- **Storage**
  - Places waste in compliant storage, defers treatment and disposal until the future

# The Alternatives and Crucial State Variables

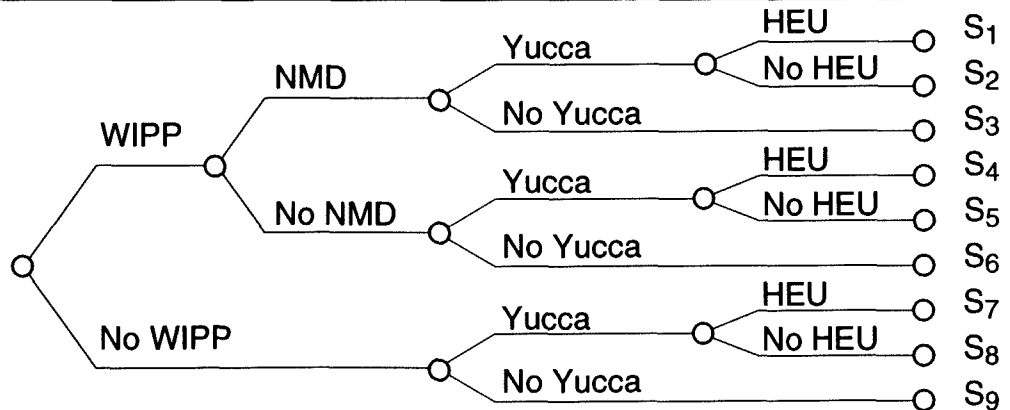
## “Bounding the Problem”

Alternatives	Scenarios								
	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	S <sub>6</sub>	S <sub>7</sub>	S <sub>8</sub>	S <sub>9</sub>
Baseline	①	5	9	13	17	21	25	29	33
Full treatment	②	6	10	14 <sup>1</sup>	18	22	26	30	34
Minimal treatment	③	7	11	15	19	23	27	31	35
Storage	4	8	12	16	20	24	28	32	③⑥

### Crucial State Variables

- WIPP availability
- No-migration determination (NMD)
- Yucca Mountain availability
- Acceptability of highly-enriched uranium (HEU) at Yucca Mountain

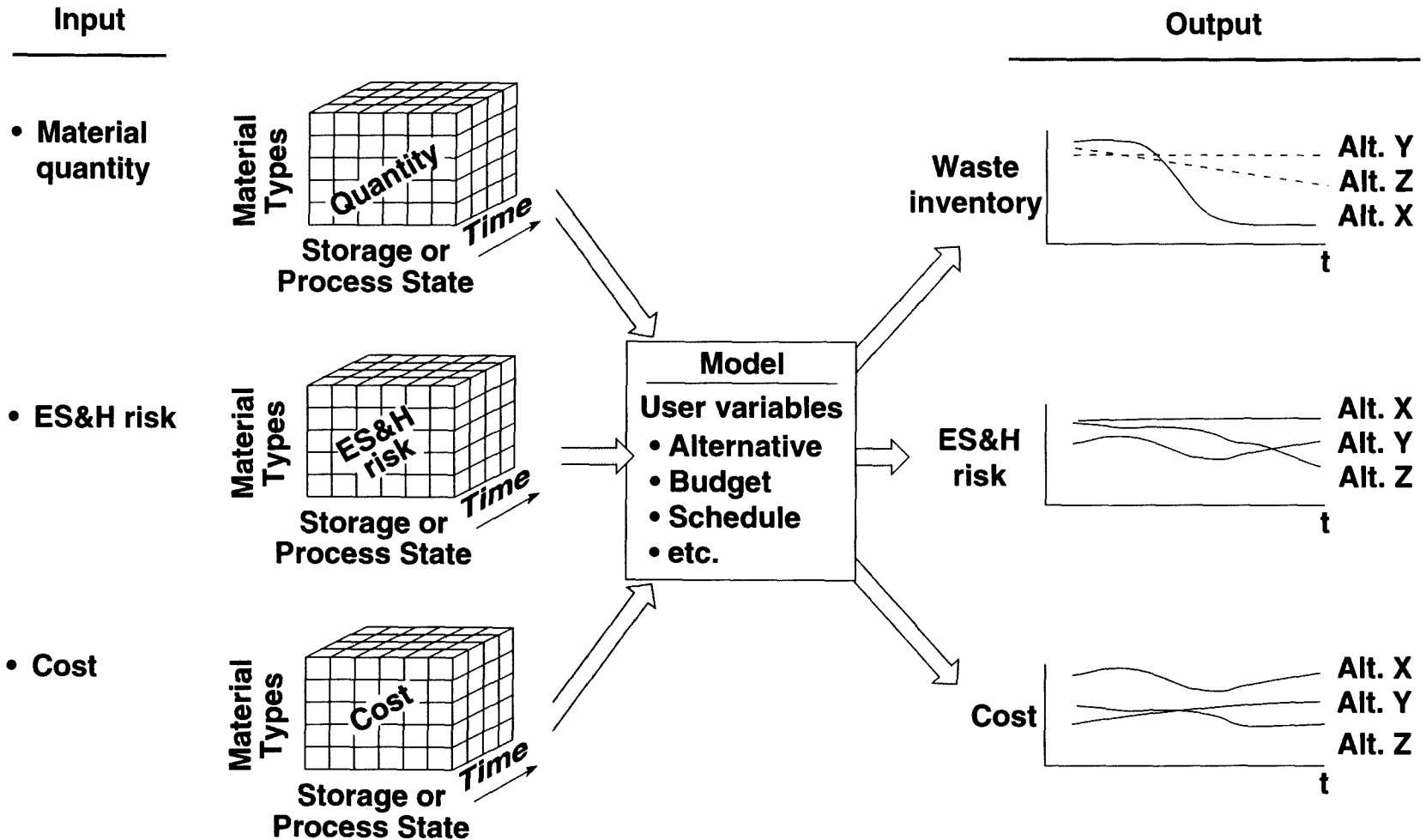
### The Possible Combinations of State Variables Generate Nine Scenarios



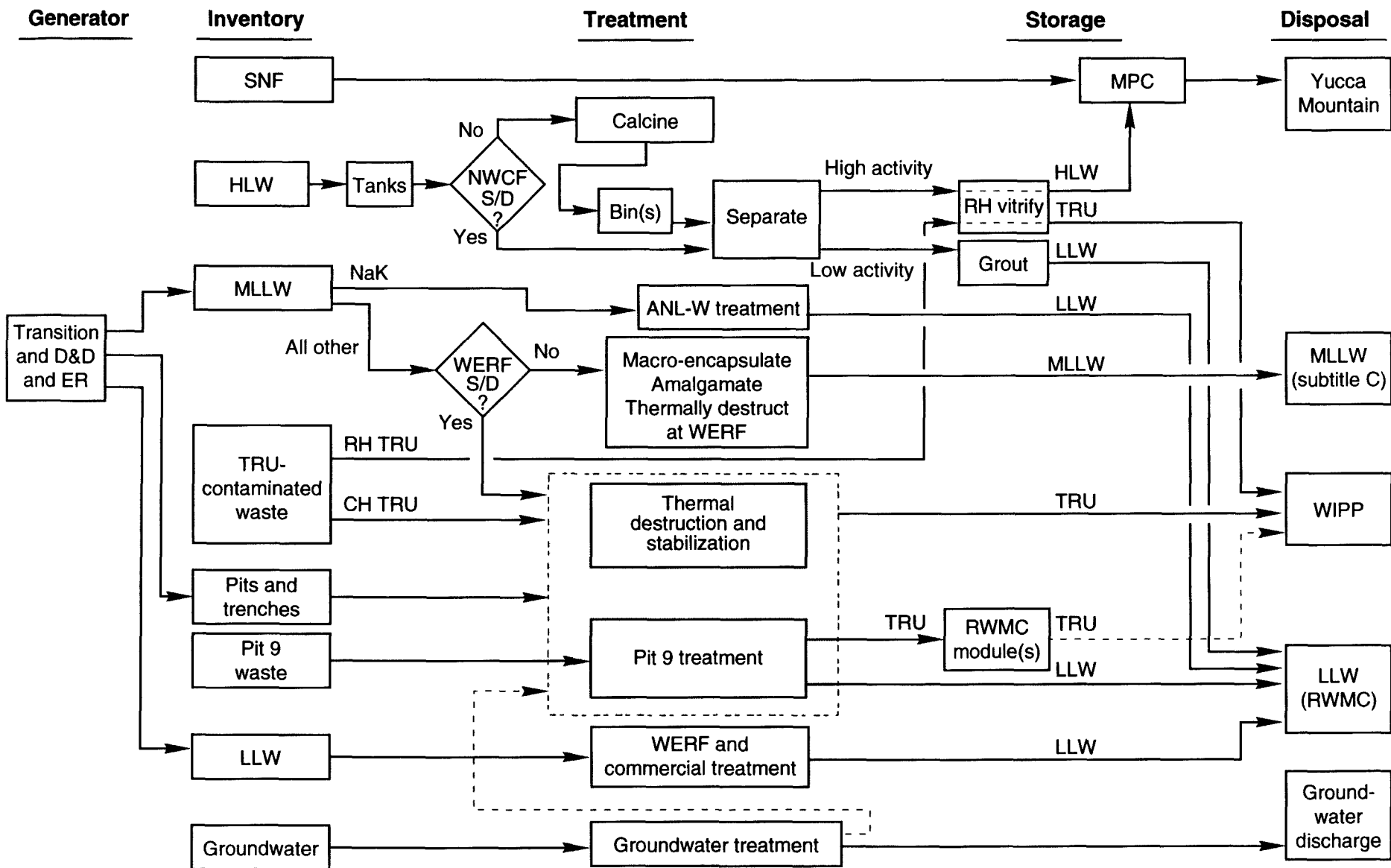
Note 1.

The Full Treatment Alternative is insensitive to the no-migration determination. Therefore, case 2 and case 14 are equivalent.

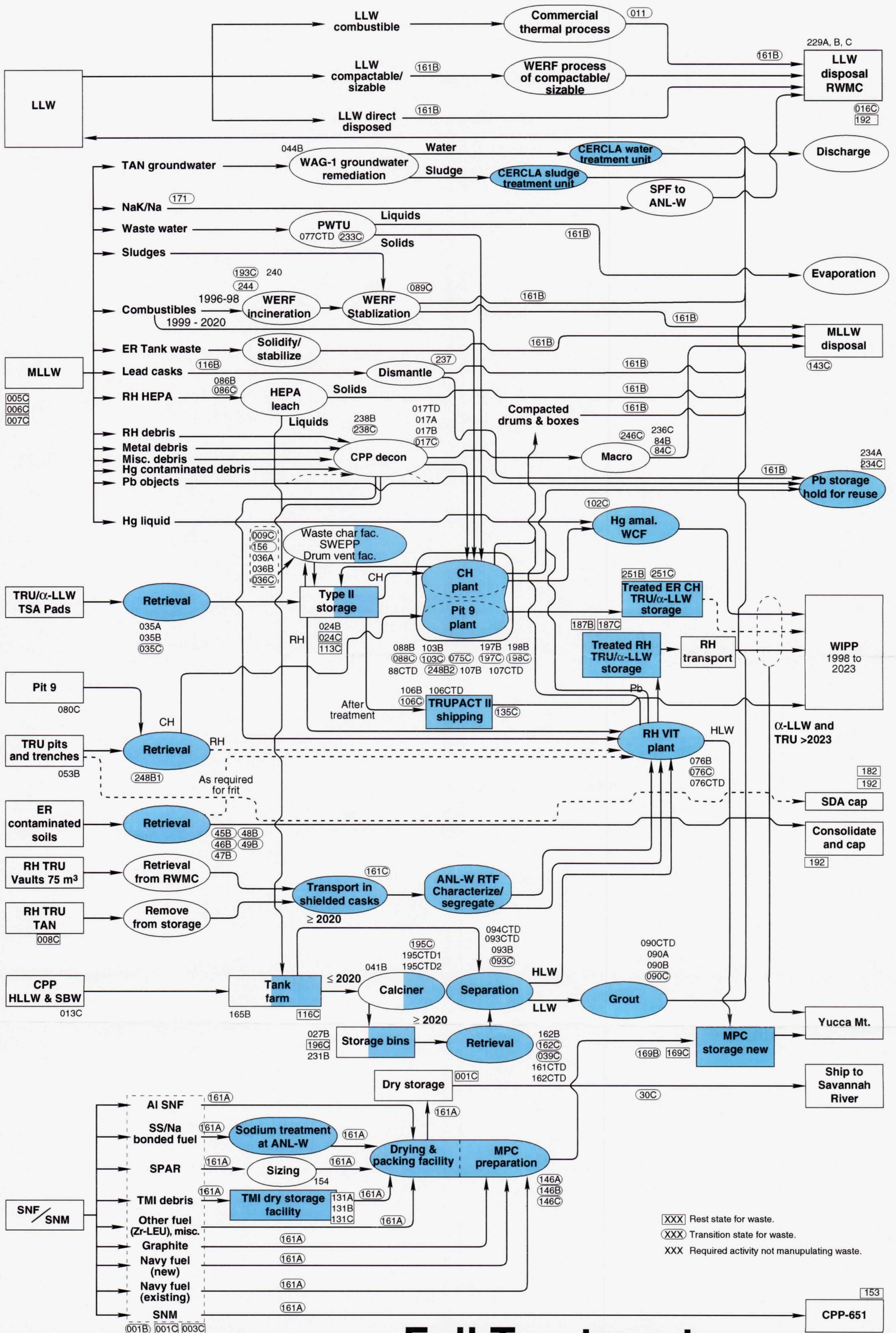
# INEL EM Integration Model



# Full Treatment



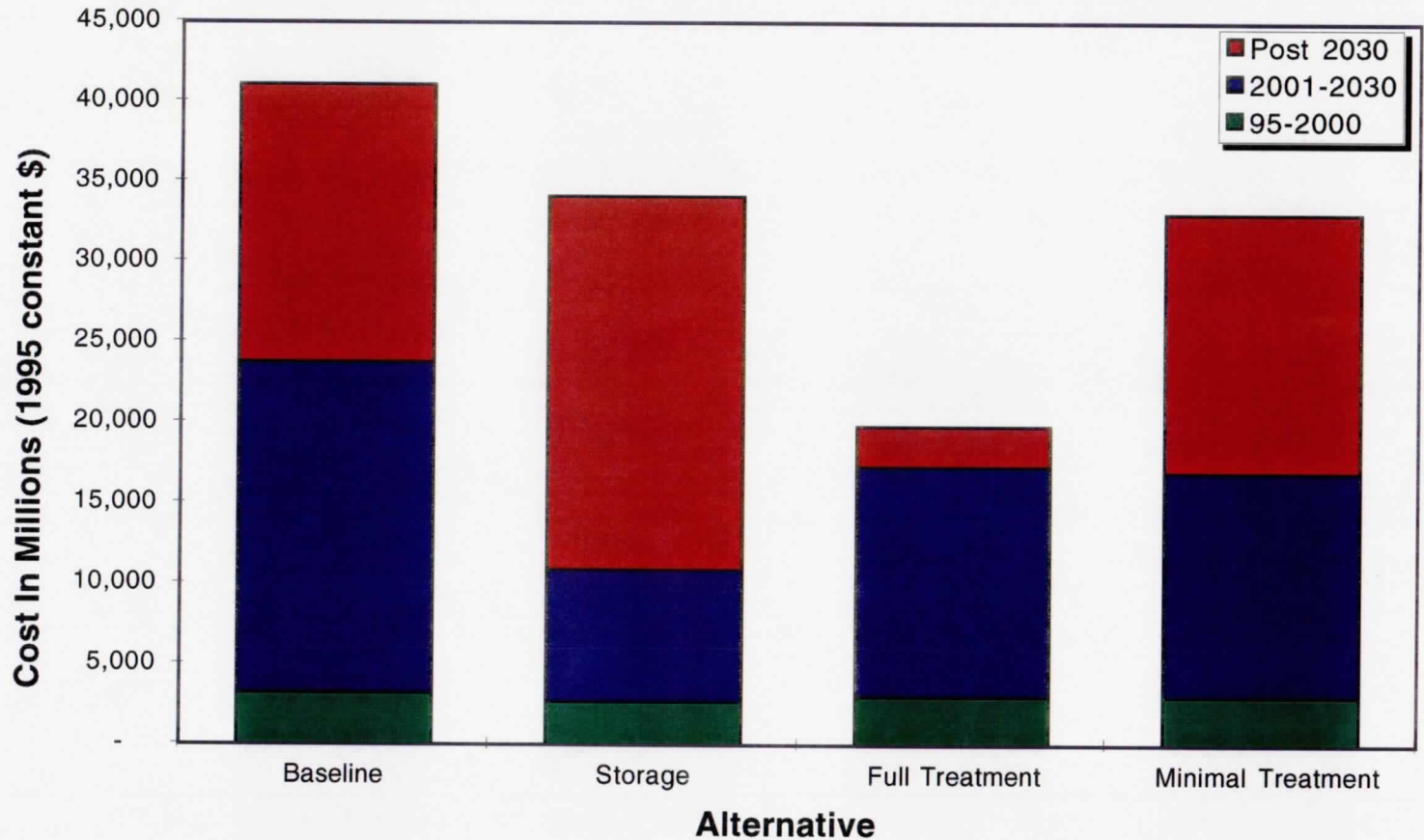




XXX Rest state for waste.  
 XXX Transition state for waste.  
 XXX Required activity not manipulating waste.

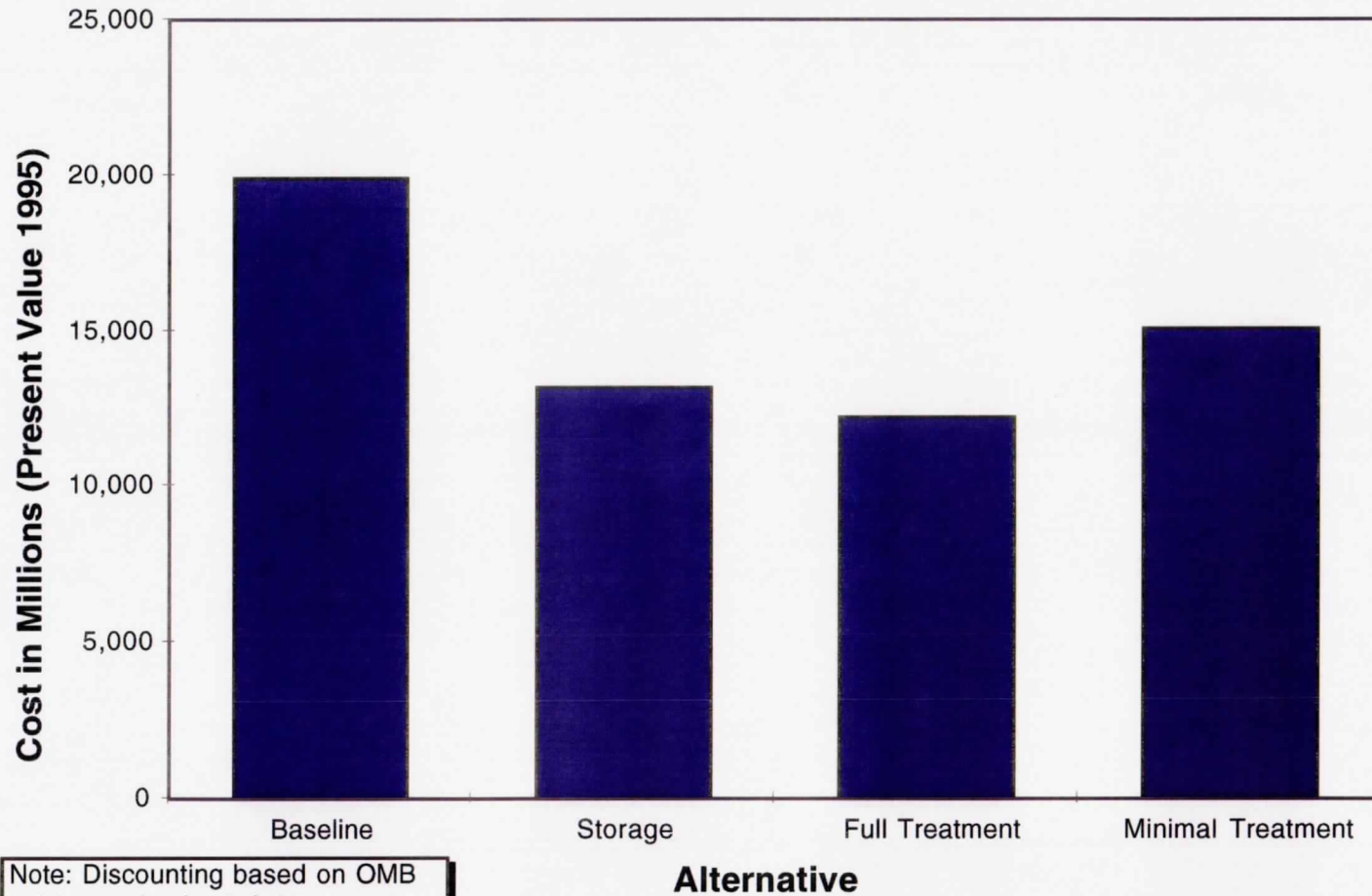
# Full Treatment

# Comparative Costs for Full Treatment and Other Alternatives (1995 constant \$)

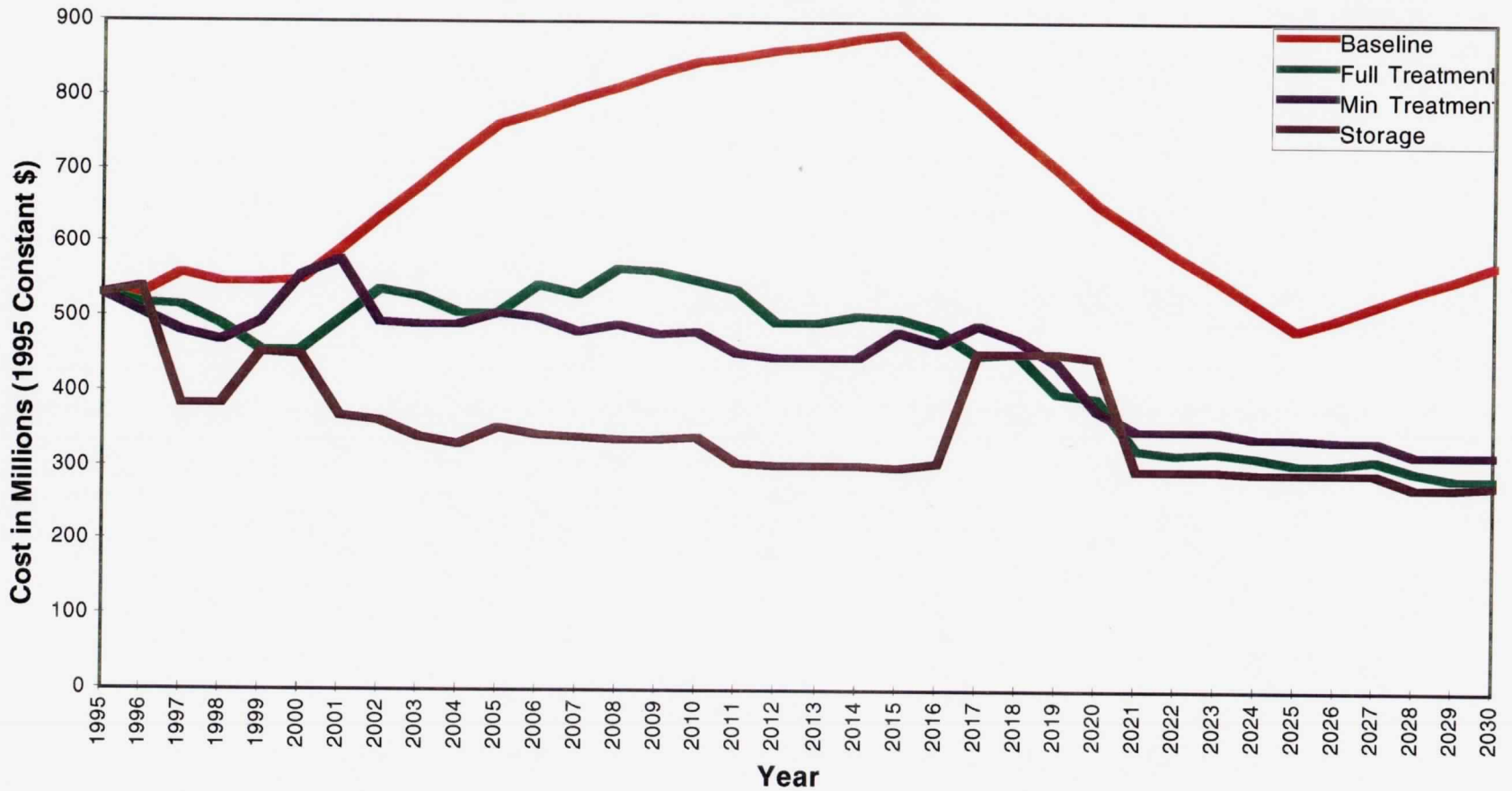




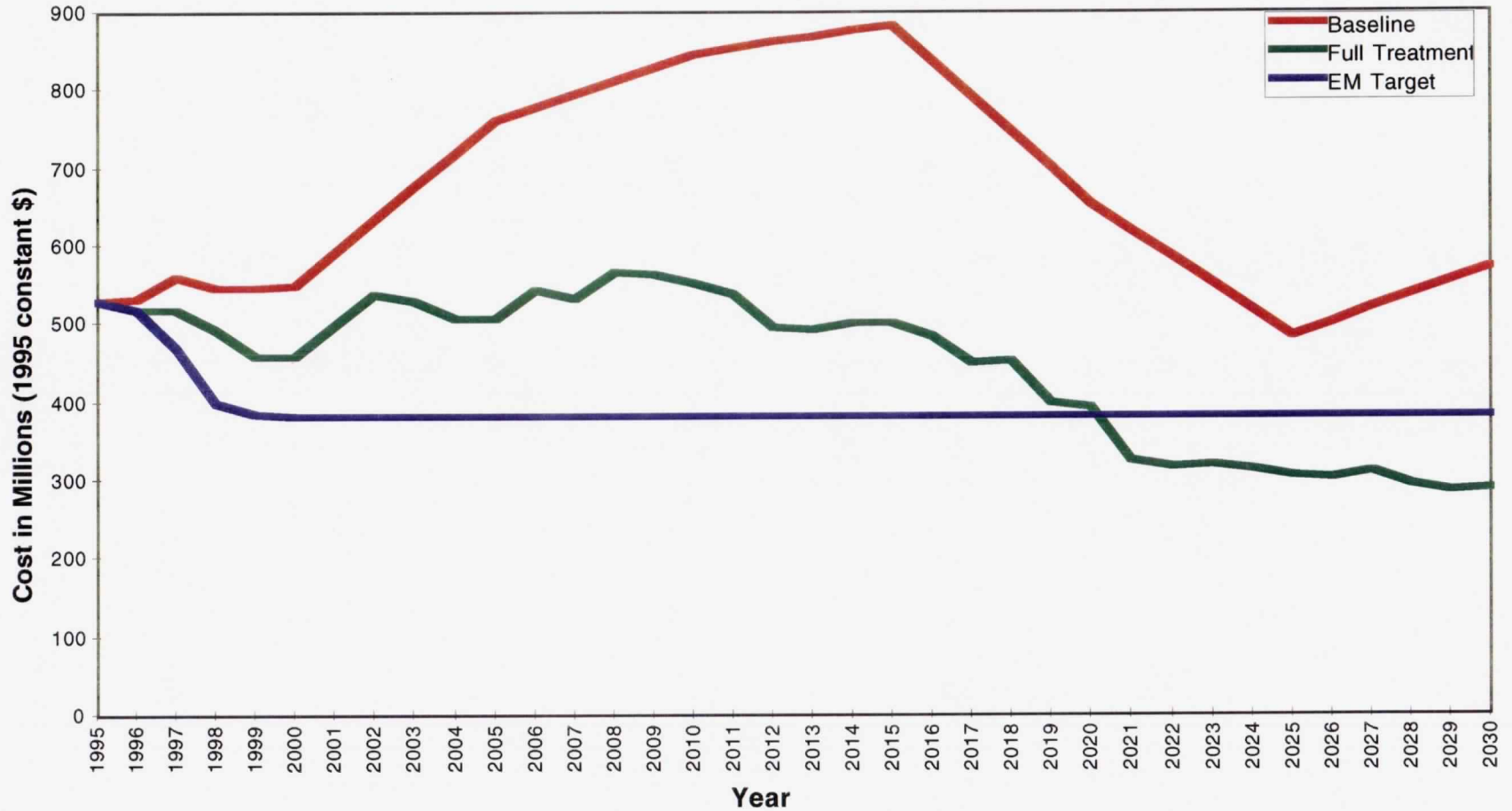
# Present Value for Full Treatment and Other Alternatives



# Alternative Cost Time Profiles

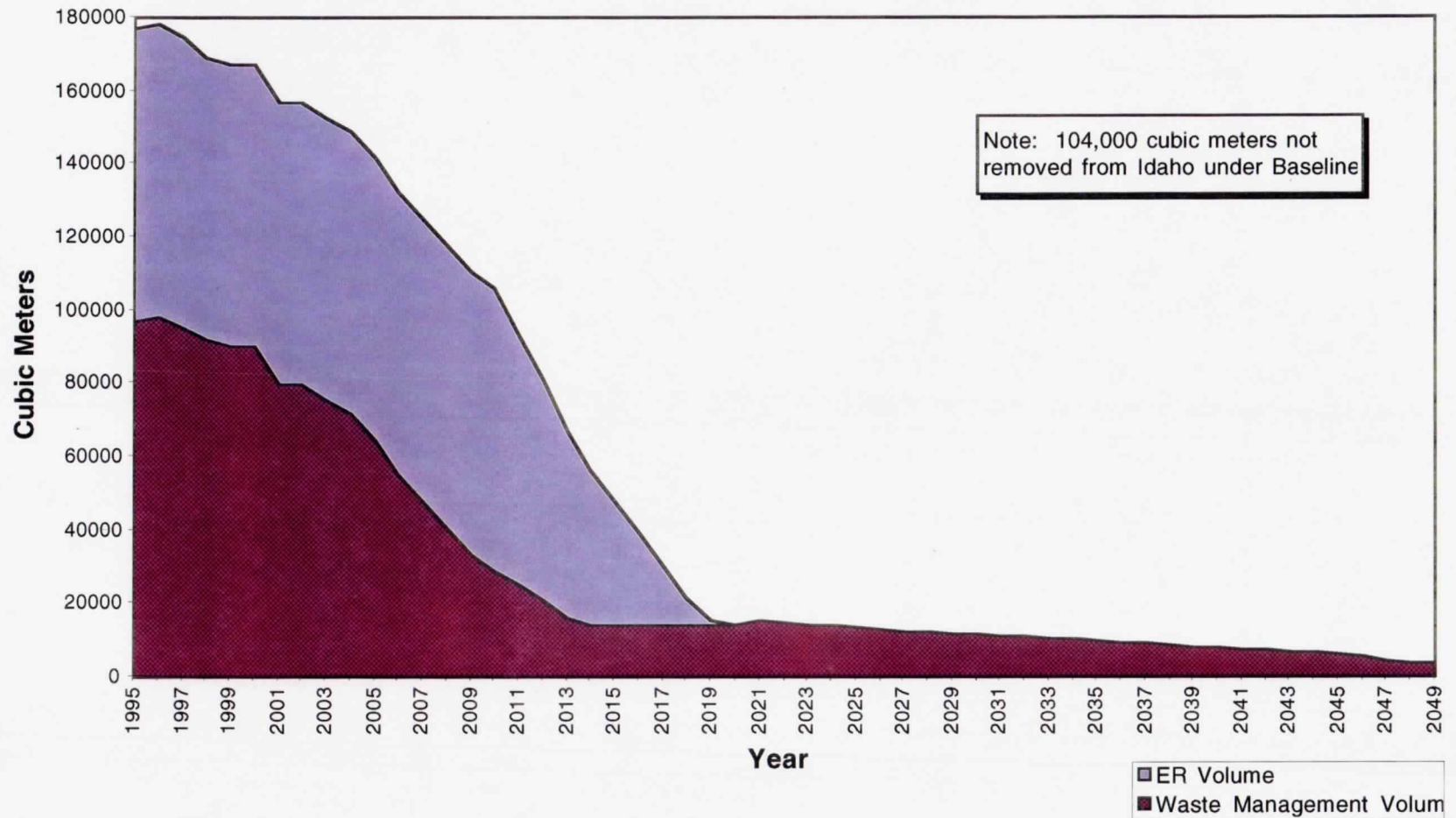


# Cost Time Profiles

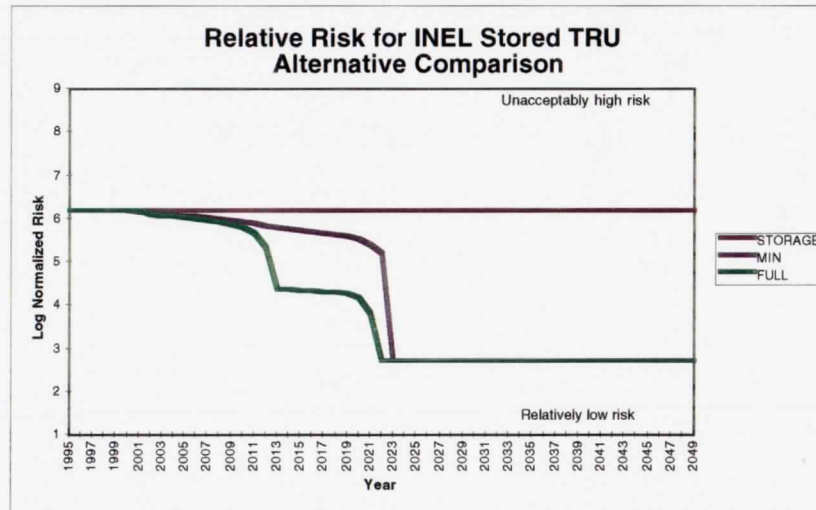
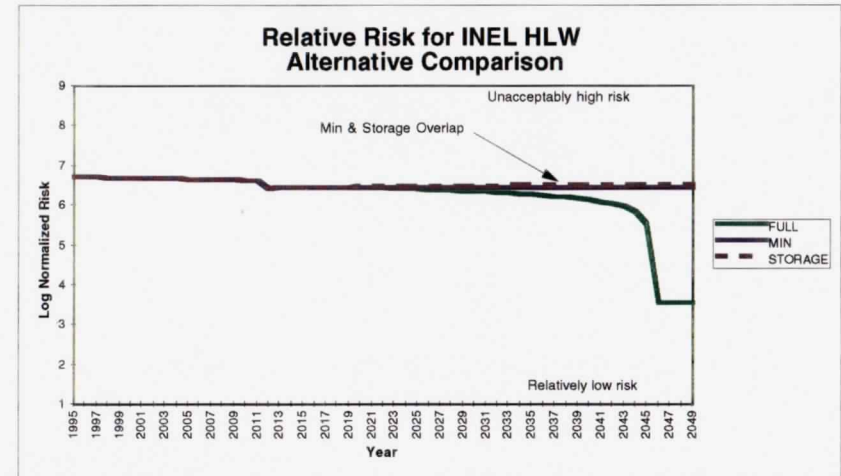
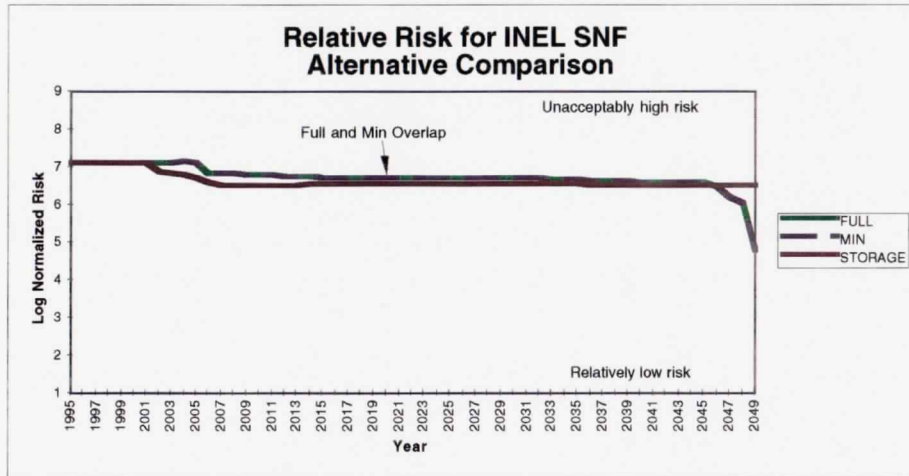


# Reduction of Waste/Materials in Idaho

## Full Treatment Alternative



# Risk Comparison by Alternative



# Benefits of Full Treatment

---

---

## Cost Control

- **Eliminates funding peaks**
- **Saves \$7 billion over 35 years compared to Baseline**
- **Achieves additional cost savings if regional or complex-wide waste streams are integrated**

## Measurable Results

- **Makes major waste streams “road ready” for disposal**
  - **Satisfies WIPP operations window**
  - **Sends all SNF/HLW to Yucca by 2050**
- **Extends repository operating life through volume reduction**
- **Results in “best” waste form for storage if repositories are delayed; insensitive to WIPP no-migration determination**



# Benefits of Full Treatment (cont'd)

---

---

## ES&H Risk Reduction

- Achieved by treatment
- Achieved by disposal to deep geologic repositories

## Stakeholder Concerns

- Moves more waste out of Idaho
- Achieves measurable results