

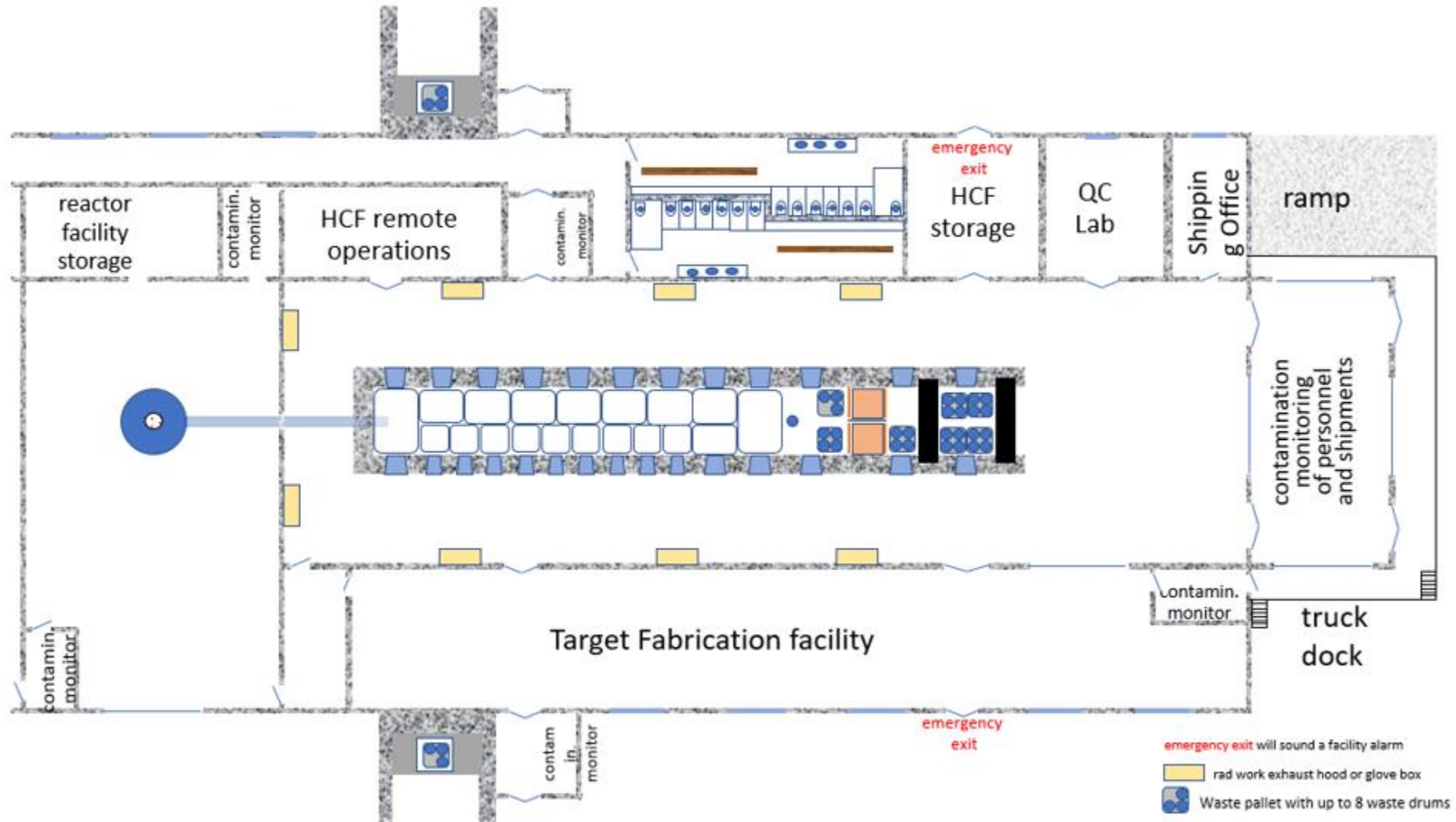


**EDEN**

**RADIOISOTOPES**

NRC Pre-application Meeting

# Facility Layout



# Eden IPF Proposed Licensing Path

## 10 CFR Part 50

- Reactor Facility
- Combined CP and OL
- Key activities:
  - Target irradiation
  - Target storage
  - Target transfer

## 10 CFR Part 70

- Hot Cell Facility
- Target Fabrication Facility
- Key Activities:
  - Chemical processing
  - Target handling
  - Waste storage and shipping
  - Target fabrication and storage

Task Name	Duration	Start	Finish	2020				2021				2022							
				Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
- 1 NRC Licensing	871d	05/01/19	09/01/22																
- 1.1 Reactor License	871d	05/01/19	09/01/22																
1.1.1 Preparation of License Application	284d	05/01/19	06/01/20																
Submittal of License Application	0	06/01/20	06/01/20																
Acceptance Review Period	66d	06/02/20	09/01/20																
- 1.1.2 Requests for Additional Information	348d	09/02/20	12/31/21																
RAI (round 1)	173d	09/02/20	04/30/21																
RAI (round 2)	175d	05/03/21	12/31/21																
- 1.1.3 Final Hearings	173d	12/31/21	09/01/22																
Publication of Draft Safety Evaluation Report	0	12/31/21	12/31/21																
ACRS Subcommittee Meeting	0	02/01/22	02/01/22																
ACRS Subcommittee Meeting	0	03/01/22	03/01/22																
ACRS Full Committee Hearing	0	04/01/22	04/01/22																
Completion of Safety Analysis Report	0	05/01/22	05/01/22																
Mandatory Hearing on Construction Permit App	0	07/01/22	07/01/22																
Decision on Construction Permit	0	09/01/22	09/01/22																
- 1.2 Hot Cell License	806d	05/01/19	06/01/22																
Preparation of License Application	438d	05/01/19	01/01/21																
Submittal of License Application	0	01/01/21	01/01/21																
NRC Review of License Application	368d	01/04/21	06/01/22																

Task Name	Duration	Start	Finish	2022				2023				2024			
				Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
<b>- 2 Construction</b>	436d	01/01/22	09/01/23												
Pre-construction Activities (utilities, roads, etc...)	89d	01/01/22	05/04/22												
Facility Construction	262d	09/01/22	09/01/23												
<b>- 3 Initial Operations</b>	522d	09/01/22	09/01/24												
Plant Personnel Hiring/Training	262d	09/01/22	09/01/23												
Startup Testing and ORR	260d	09/04/23	08/30/24												
Start Production	0	09/01/24	09/01/24												

# Coordination of Two Licensing Paths

## Environmental Report

- Will be submitted with Part 50 License
- Information will bound activities of all facilities and their activities

## Facility Boundary

- Part 50 and 70 facilities will have a separating nuclear facility boundary
- Facilities will share a target transfer pool

## Conduct of Operations

- Conduct of Operations will be submitted for each license application
- Procedures will coordinate and implement requirements of both

# Key Additions for Part 50 Combined License Application

- Technical Specifications
- Emergency Plan, Physical Security, QAPD
- Need clarification on:
  - Cyber security
  - Procedures
  - Building drawings

Handling  
Future Facility  
Changes  
(post-  
operation)

---

Automated target  
handling system

---

Activation targets

---

Target fabrication  
improvements



# Batch Clarification

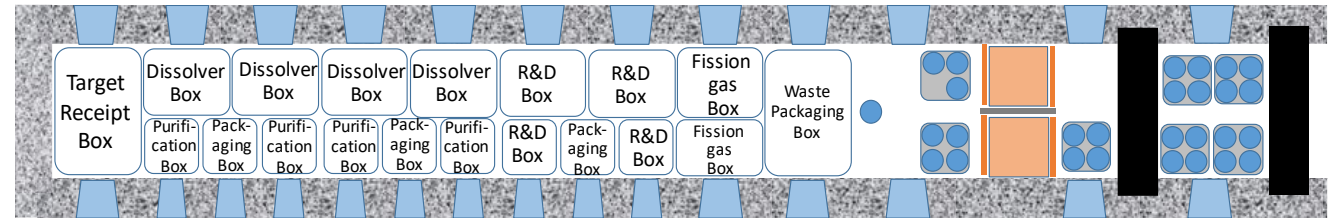
Eden will limit 100 g of U-235 per “batch” in the Hot Cell Facility

10 CFR 50.2 Production Facility Exception (iii):

“facilities in which processing is conducted pursuant to a license issued under parts 30 and 70 of this chapter, or equivalent regulations of an Agreement State, for the receipt, possession, use, and transfer of irradiated special nuclear material, which authorizes the processing of the irradiated material on a batch basis for the separation of selected fission products and limits the process batch to not more than 100 grams of uranium enriched in the isotope 235 and not more than 15 grams of any other special nuclear material.”

# Process Line

- Each batch will correspond to a dissolution tank per line; may process multiple lines simultaneously
- “ Process Batch” distinguished by independence of box and line, limit of U-235, and solution form while separating FP
- Uranium will only be in this solution form (<100 g U-235 per line) in the dissolution box
- There will be some redundancy in packaging boxes, but uranium will be in solid form.



Dissolution Box

Here, targets are dissolved in uranyl nitrate solution. Final products are  $U_3O_8$  and Titania Moly column

Purification Box

Moly column is purified of fission products.  $U_3O_8$  further purified of FP.

Packaging Box

# Target Qualification

- Previous pre-application meeting brought up concerns over qualification of Eden driver targets
- Range of solutions:
  - Eliminate use of driver targets
  - Limit burnup of driver targets
    - Driver targets are only irradiated for <1 month on par with irradiation of other experiments
    - Driver targets may not be processed for Mo-99, but can be treated as “experiments” with low burnup/irradiation times. Driver targets may be useful in HCF operator training.



Thank You