

ENVIRONMENTAL EVALUATION NOTIFICATION FORM

Grantee/Contractor Laboratory: Princeton University/Princeton Plasma Physics Laboratory (PPPL)

Project/Activity Title: Tritium System Demolition & Disposal

CH NEPA Tracking No.: _____ Type of Funding SC

B&R Code: _____ Total Estimated Cost: \$ 33.4 million

DOE Cognizant Secretarial Officer (CSO): Marc Jones

Contractor Project Manager: _____ Signature: _____

Date: _____

Contractor NEPA Reviewer: Dorothy M. Strauss Signature: Dorothy Digitally signed by Dorothy M. Strauss

Date: M. Strauss Date: 2020.01.13 14:08:05 -05'00'

I. Description of Proposed Action:

The tritium processing systems and neutral beam injection equipment used during the 1990's Deuterium-Tritium (D-T) experiments for the Tokamak Fusion Test Reactor (TFTR) are aging, contain about 1,000 Curies of residual tritium in components, and are not planned for future use. This project would remove and dispose of the components of these tritium systems, including glove boxes, fume hoods, gas holding tanks, tritium purification system (TPS) process piping, (all located in the tritium area in the D-Site basement), parts of the neutral beam boxes (located in the TFTR test cell), contaminated HVAC ductwork (from both locations), and control room components (located separately in the D-Site basement). Excepting the control room components, which would be recycled or disposed of as domestic waste, these components bear low levels of tritium contamination and would be disposed of as low-level radioactive waste at a DOE-approved disposal site. Removal activities are anticipated to result in airborne tritium releases to the existing monitored stack that are expected to be less than 100 Curies/year, and tritium releases of less than 1 Curie/year in liquid form through the existing PPPL liquid effluent collection tank (LECT) system to the municipal sanitary sewer system. These releases would result in a peak annual dose to the maximum exposed individual (MEI) of <0.1 mrem/year. A theoretical release of the entire tritium inventory of 1,000 Curies would result in a peak dose to the maximum exposed individual of 1.6 mrem. These doses are small fractions of the average annual background dose of 600 mrem/year from all radiation sources. Parts retained from the neutral beam boxes would be stored in an area that exhausts to the existing monitored stack.

This project would result in a savings of approximately \$350,000/year in operational costs for radiological monitoring, compliance, and oversight while making available approximately 5,000 GSF of high value research space. This work would be conducted by subcontracted industry experts subject to PPPL oversight.

II. Description of Affected Environment: D-Site, TFTR Test Cell and Basement (see attached maps and figures).

PPPL is located on Princeton University's James Forrestal Campus in Plainsboro Township, Middlesex County (central New Jersey), adjacent to the municipalities of Princeton, Kingston, East and West Windsor, and Cranbury, NJ. It occupies approximately

90.83 acres in the areas known as "C- and D-Sites." PPPL has operated on the current site since 1959. The closest urban centers are New Brunswick, 14 miles (22.5 km) to the northeast, and Trenton, 12 miles (19 km) to the southwest. Within a 50-mile (80 km) radius are the major urban centers of New York City, Philadelphia, and Newark. Princeton University's main campus is approximately three miles west of the site, primarily located within the borough of Princeton.

The estimated resident population within 10 miles (16 km) of PPPL is approximately 500,000. The total estimated population within a 50-mile radius (80km) of PPPL is approximately 17,735,164.

Surrounding the site are lands of preserved and undisturbed areas including upland forest, wetlands, open grassy areas, and a minor stream, Bee Brook, which flows along PPPL's eastern boundary. These areas are designated as open space in the James Forrestal Campus (JFC) site development plan.

The climate of central New Jersey is classified as mid-latitude, rainy climate with mild winters, hot summers, and no dry season. Temperatures may range from below zero to above 100 degrees Fahrenheit (°F) (-17.8° Celsius (C) to 37.8° C); extreme temperatures typically occur once every five years. Approximately half the year, from late April until mid-October, the days are freeze-free. Normally the climate is moderately humid with a total average precipitation of about 46 inches (116 cm) evenly distributed throughout the year.

III. **Potential Environmental Effects:** (Attach explanation for each "yes" response, and "no" responses if additional information is available and could be significant in the decision-making process.)

A. Sensitive Resources: Will the proposed action result in changes and/or disturbances to any of the following resources?

	<u>Yes/No</u>
1. Threatened/Endangered Species and/or Critical Habitats	1. No
2. Other Protected Species (e.g. Burros, Migratory Birds)	2. No
3. Wetlands	3. No
4. Archaeological/Historic Resources	4. No
5. Prime, Unique or Important Farmland	5. No
6. Non-Attainment Areas	6. No
7. Class I Air Quality Control Region	7. No
8. Special Sources of Groundwater (e.g. Sole Source Aquifer)	8. No
9. Navigable Air Space	9. No
10. Coastal Zones	10. No
11. Areas w/ Special National Designation (e.g. National Forests, Parks, Trails)	11. No
12. Floodplain	12. No

B. Regulated Substances/Activities: Will the proposed action involve any of the following regulated substances or activities?

	<u>Yes/No</u>
13. Clearing or Excavation (indicate if greater than 1 acre [43,560 sq. ft.]; if more than 5,000 sq. ft., a Soil Erosion / Sediment Control Permit may be required from Freehold Soil Conservation District.) <i>Note: Soil disturbance includes clearing, grading, excavation, storage, and filling. Soil erosion and sediment control permits required if $\geq 5,000$ sq. ft. Note: Excavations expected to encounter ground water may require a permit.</i>	13. No
14. Dredge or Fill (under Clean Water Act section 404; indicate if greater than 1 acre)	14. No
15. Noise (in excess of regulations)	15. No
16. Asbestos Removal <i>Asbestos-containing materials including approx. 1.1 tons of floor tiles from the tritium area would be removed and disposed of by an asbestos-certified contractor.</i>	16. Yes
17. PCBs	17. No
18. Import, Manufacture or Processing of Toxic Substances	18. No
19. Chemical Storage/Use <i>Standard chemicals (alcohol, lubricating oils to support cutting equipment, etc.) would be used with SDSs provided to Industrial Hygiene at least 24 hours prior to first use.</i>	19. Yes
20. Pesticide Use	20. No
21. Hazardous, Toxic, or Criteria Pollutant Air Emissions <i>Anticipated releases to the monitored stack are expected to be ~ 10-100 Curies/year.</i>	21. Yes
22. Liquid Effluent <i>Liquid effluent collection tank (LECT) releases to the municipal sanitary sewer system would be controlled to remain at less than 1 Curie/year, which is less than allowable limits of the NJ Dept. of Environmental Protection.</i>	22. Yes
23. Underground Injection	23. No
24. Hazardous Waste <i>In addition to the floor tiles noted above, installed batteries, oil, and other components removed from the tritium system may be disposed of as hazardous waste according to current procedure.</i>	24. Yes
25. Underground Storage Tanks	25. No
26. Radioactive (AEA) Mixed Waste	26. No
27. Radioactive Waste <i>Approximately 99.5 tons of tritium system components and piping, 240 tons of material from the neutral beam boxes, and .5 tons of galvanized sheet metal ductwork would be disposed of according to current procedure as low-level radioactive waste at a DOE-approved disposal site.</i>	27. Yes
28. Radiation Exposures <i>Tritium contamination is present in the tritium system components and piping. The total amount of tritium on-site is estimated to be less than 1,000 Curies. Work in the TFTR test cell may expose workers to low levels of tritium or contamination. Workers would adhere to provisions in the approved Radiation Protection Program and PPPL Health Physics personnel would provide monitoring and oversight. Radiation exposures would be managed well below the PPPL Administrative Control Level of 1,000 mrem per calendar year per person and 600 mrem per calendar quarter.</i>	28. Yes

C. Other Relevant Disclosures. Will the proposed action involve the following?

	<u>Yes/No</u>
29. A threatened violation of ES&H regulations/permit requirements	29. No

The requirements of 10CFR851 (as implemented under the DOE-approved PPPL Worker Safety and Health Program) would be applied to work at PPPL under this proposed action. The subcontractor would be required to provide a Health and Safety Plan and Waste Management Plan for PPPL review and approval.

- | | | |
|-----|--|--------|
| 30. | Siting/Construction/Major Modification of Waste Recovery, or TSD Facilities | 30. No |
| 31. | Disturbance of Pre-existing Contamination
<i>Note: Excavations that encounter contaminated ground water require a permit.</i> | 31. No |
| 32. | New or Modified Federal/State Permits | 32. No |
| 33. | Public controversy | 33. No |
| 34. | Action/involvement of Another Federal Agency (e.g. license, funding, approval) | 34. No |
| 35. | Action of a State Agency in a State with NEPA-type law.
(Does the State Environmental Quality Review Act Apply?) | 35. No |
| 36. | Public Utilities/Services | 36. No |
| 37. | Depletion of a Non-Renewable Resource | 37. No |

IV. **Section D Determination:** Is the project/activity appropriate for a determination under Subpart D of the DOE NEPA Regulations for compliance with NEPA?

DOE-PSO NEPA Compliance Officer (NCO) Review:

Concurrence with Proposed Class of Action Recommended

CX EA EIS

Categories: B1.23 (Demolition and disposal of buildings), B1.16 (Asbestos removal)

For Categorical Exclusions (CXs):

A. The proposed action fits within a class of actions that is listed in Appendix A or B to Subpart D.

For classes of actions listed in Appendix B, the following conditions are integral elements; i.e., to fit within a class, the proposal must not:

- 1) Threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, including DOE and/or Executive Orders;
- 2) Require siting, construction, or major expansion of waste storage, disposal, recovery, or treatment facilities, but may include such categorically excluded facilities;
- 3) Disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; or
- 4) Adversely affect environmentally sensitive resources.
- 5) Involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those of the Department of Agriculture, the Environmental Protection Agency, and the National Institutes of Health.

- B. There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal; and
- C. The proposal is not "connected" to other actions with potentially significant impacts, is not related to other proposed actions with cumulatively significant impacts, and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211.

V. DOE Recommendation Approval:

Digitally signed by TRACY ESTES
 Date: 2020.01.14 15:32:01 -05'00'

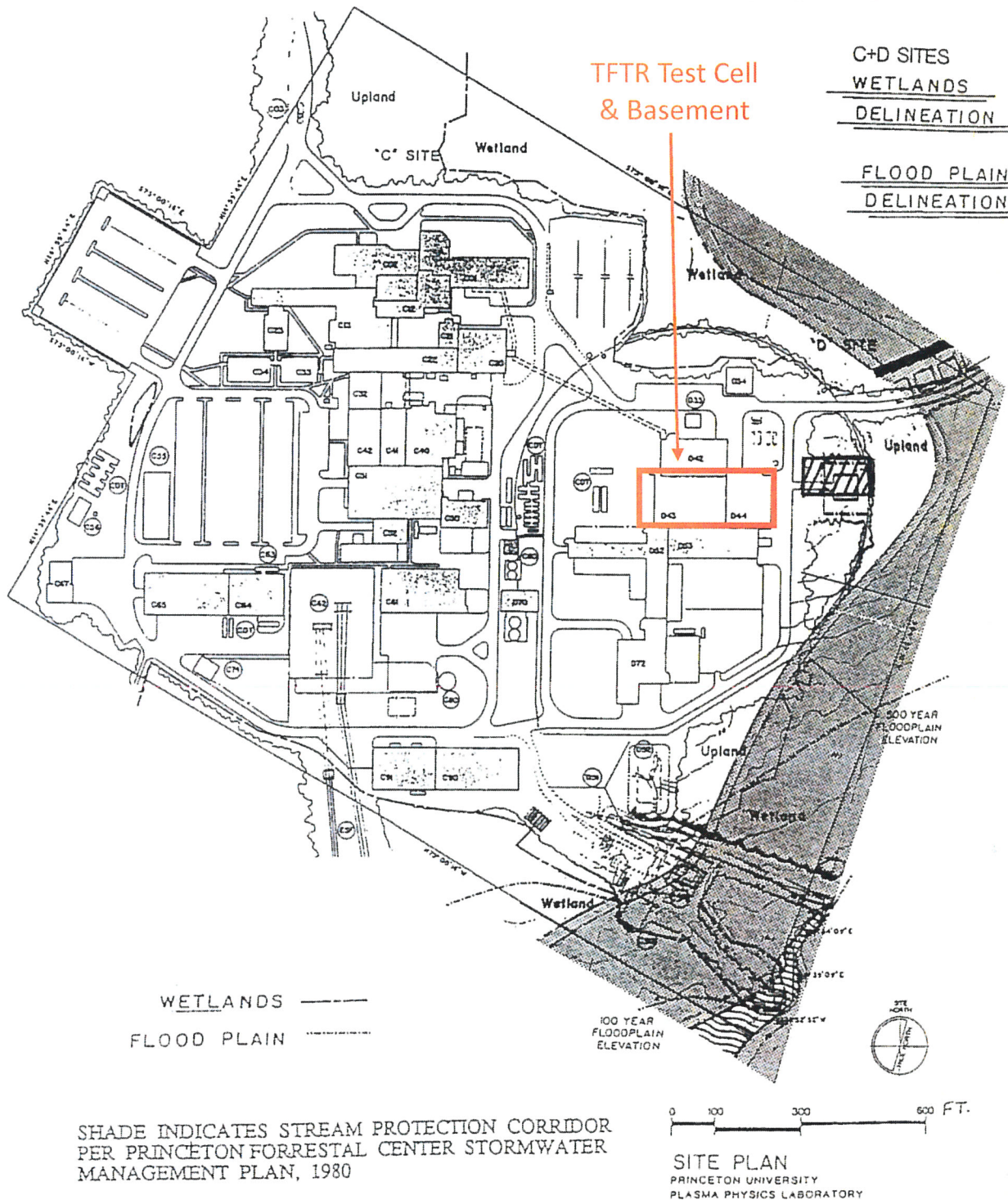
PSO Staff: Tracy Estes Signature: TRACY ESTES
 Date: _____

SC GLD: Michael M. McCann Signature: 
 Date: 1/14/2020

VI. NEPA Compliance Officer Subpart D CX Determination and Approval:

Based on my review of information conveyed to me and in my possession (or attached) concerning the proposed action, as NEPA Compliance Officer, I have determined that the proposed action fits within the specified class of actions, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

PSO NCO: Teralyn Murray Signature: 
 Date: 1/14/2020



SHADE INDICATES STREAM PROTECTION CORRIDOR PER PRINCETON FORRESTAL CENTER STORMWATER MANAGEMENT PLAN, 1980

SITE PLAN
PRINCETON UNIVERSITY
PLASMA PHYSICS LABORATORY

Tritium System Demolition and Disposal

TFTR Test Cell

NO.	REVISION	BY	CH	SUP	APPROVED	DATE
1	REVISED SQ. FT. PER EGN-5342 TO REFLECT CHANGES TO REFLECT ACTUAL CONDITIONS PER EGN-7424	JUN	JS	EA	EA	03/21/08
2	ADDED FIRE BARRIERS PER EGN-7816	TK	DS	LM	MY	07/22/15
3		TK	SD	LM	MD	01/04/17



HIGH BAY	24,539 SQ. FT.	NSF	LSE
GENERAL DRY	1,860 SQ. FT.	29,255	26,399
COMMON	2,856 SQ. FT.		
HALLS/WALLS	3,566 SQ. FT.		
	32,821 SQ. FT.		

EXPERIMENTAL AREA, 1st FLOOR	NSF	LSE
	32,821	26,399

EXPERIMENTAL AREA, 1st FLOOR, D4.3
SCALE: 1/4" = 1'-0"

PRINCETON PLASMA PHYSICS LABORATORY
PRINCETON UNIVERSITY
C & D SITES
BUILDING FLOOR PLANS
EXPERIMENTAL AREA, 1st FLOOR, D4.3

DATE: 01/14/2002 CAD FILE: 3500.3056.DWG
APPROVED:
ENG: C. POTENSKY
DWN: J. SIGEL
CHK: S. FLOHR

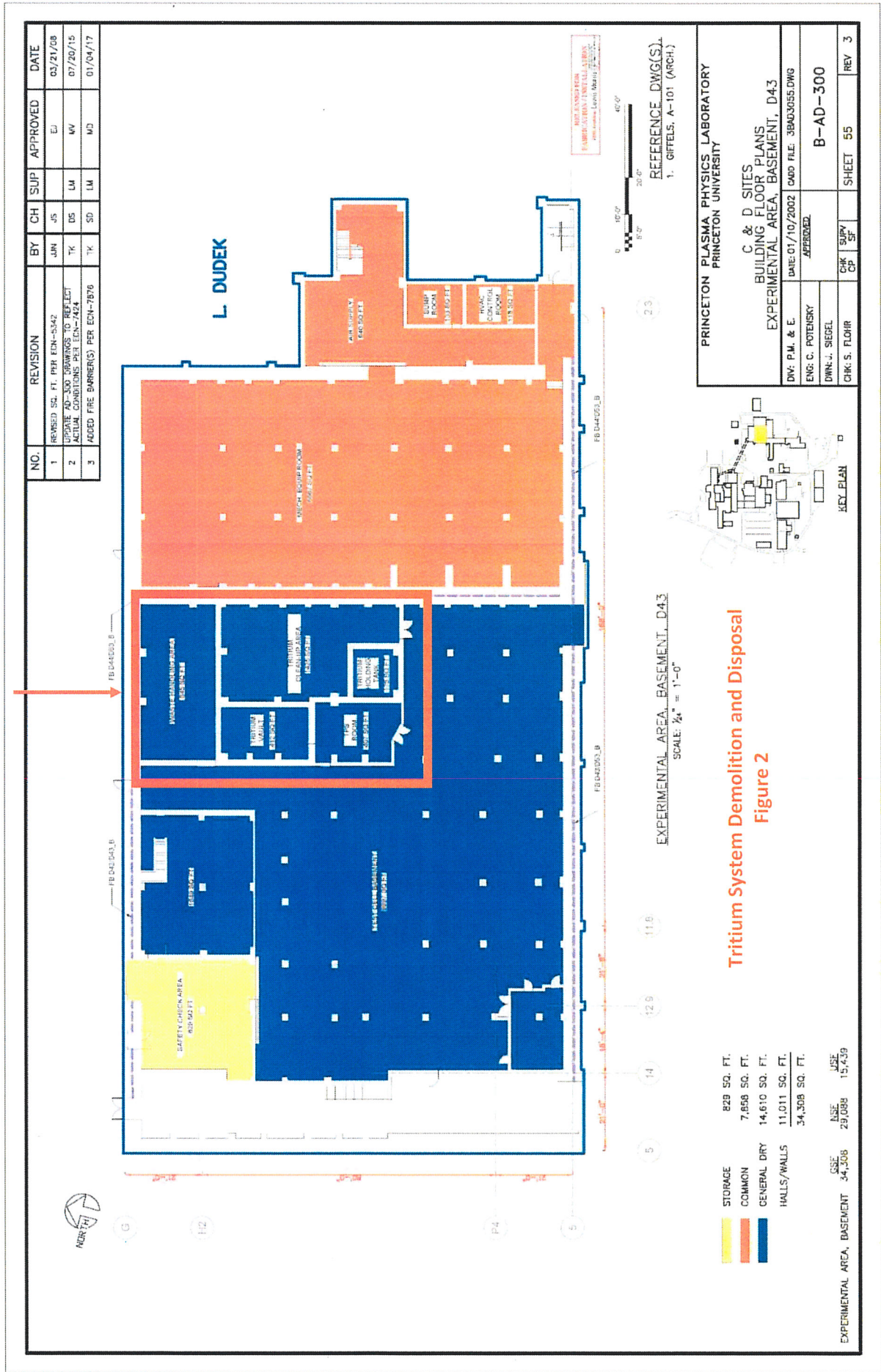
B-AD-300
SHEET 56
REV 3

REFERENCED FOR FABRICATION/INSTALLATION
SEE DRAWING

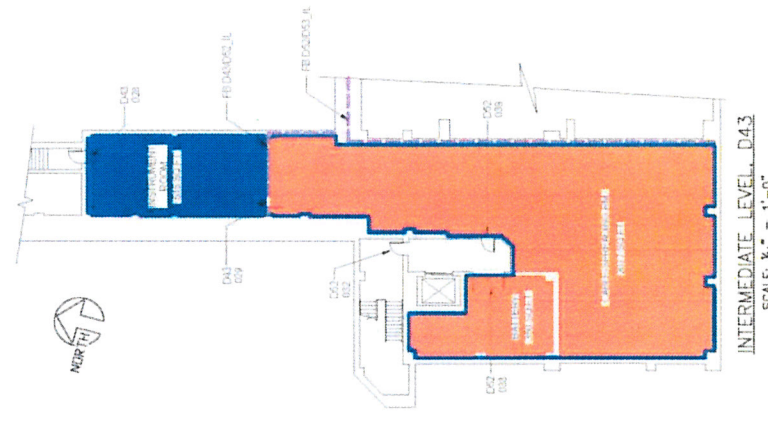
REFERENCE DWG(S):
1. GFFELS, A-107



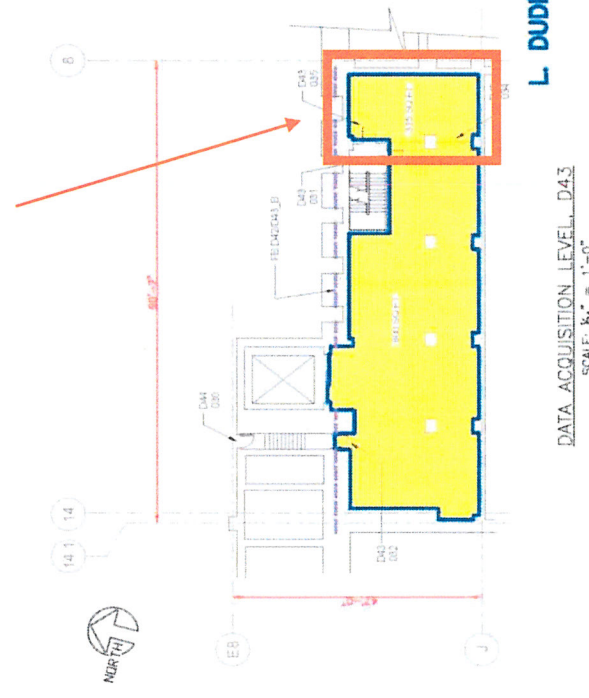
Tritium Area in TFTR Basement



NO.	REVISION	BY	CH	SUP	APPROVED	DATE
1	REVISED SQ. FT. PER ECH-5342	JUN	JS		EJ	03/21/08
2	UPDATE AD-300 DRAWINGS TO REFLECT ACTUAL CONDITIONS PER ECH-7424	TK	DS	LM	WV	08/03/15
3	ADDED FIRE BARRIER(S) PER ECH-7876	TK	SD	LM	MC	01/04/17



Tritium Area Control Room



L DUDEK



PRINCETON PLASMA PHYSICS LABORATORY PRINCETON UNIVERSITY	
C & D SITES BUILDING FLOOR PLANS DATA ACQUISITION & INTERMEDIATE FLOOR PLANS, D43	
DNV: P.M. & E.	DATE: 10/10/2002
ENG: C. POTENSKY	APPROVED:
DWRN: J. SIEGEL	CHK: SUPV SF
CHK: S. FLOHR	CP
	SHEET 59
	REV 3



GENERAL DRY WALLS	STORAGE	P.I. WALLS	INTERMEDIATE LEVEL	USE
1,115 SQ. FT.	515 SQ. FT.	2,427 SQ. FT.	GSE	USE
3,142 SQ. FT.		1,987 SQ. FT.	NSE	NSE
4,257 SQ. FT.		4,509 SQ. FT.	4,509	2,942
			2,942	2,942

Tritium System Demolition and Disposal
Figure 3