ADDENDUM A
WASTE ENCAPSULATION AND STORAGE FACILITY PART A FORM

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Dangerous Waste Permit Application

Part A Form

Date Received	Reviewed by:	Date:
Month Day Year	Approved by:	Date:

I. This form is submitted to: (place an "X" in the appropriate box)

☒	**Request modification to a final status permit (commonly called a "Part B" permit)**
☐	**Request a change under interim status**
☐	**Apply for a final status permit. This includes the application for the initial final status permit for a site or for a permit renewal (i.e., a new permit to replace an expiring permit).**
☐	**Establish interim status because of the wastes newly regulated on:** (Date)
	List waste codes:

II. EPA/State ID Number

W	A	7	8	9	0	0	0	8	9	6	7

III. Name of Facility

U.S. Department of Energy – Hanford Facility

IV. Facility Location (Physical address not P.O. Box or Route Number)

A. Street

Refer to Permit Attachment 2 – Hanford Facility Permit Legal Description

City or Town	State	ZIP Code
Near Richland	WA	

County Code (if known)	County Name
005	Benton

B. Land Type	C. Geographic Location: Latitude (degrees, mins, secs)	Longitude (degrees, mins, secs)	D. Facility Existence Date: Month Day Year
F	Refer to TOPO Map (Section XV.)		11 19 1980

V. Facility Mailing Address

Street or P.O. Box

P.O. Box 550

City or Town	State	ZIP Code
Richland	WA	99352

1

VI. Facility contact (Person to be contacted regarding waste activities at facility)		
Name (last)	**(first)**	
Charboneau	Stacy L.	
Job Title	**Phone Number (area code and**	
Manager	(509) 376-7395	
Contact Address		
Street or P.O. Box		
P.O. Box 550		
City or Town	**State**	**ZIP Code**
Richland	WA	99352

VII. Facility Operator Information	
A. Name	**Phone Number**
U.S. Department of Energy Owner/Operator CH2M HILL Plateau Remediation Company Co-Operator for dangerous waste management units in the Waste Encapsulation and Storage Facility Unit Group*	(509) 376-7395 (509) 376-0556*
Street or P.O. Box	
P.O. Box 550 P.O. Box 1600*	

City or Town	State	ZIP Code
Richland	WA	99352

B. Operator Type	F

C. Does the name in VII.A reflect a proposed change in operator?	☐ Yes ☒ No
If yes, provide the scheduled date for the change:	Month Day Year

D. Is the name listed in VII.A. also the owner? If yes, skip to Section VIII.C.	☐ Yes ☒ No

VIII. Facility Owner Information	
A. Name	**Phone Number (area code and number)**
U.S. Department of Energy Owner/Operator	(509) 376-7395
Street or P.O. Box	
P.O. Box 550	

City or Town	State	ZIP Code
Richland	WA	99352

B. Owner Type	F

C. Does the name in VIII.A reflect a proposed change in owner?	☐ Yes ☒ No
If yes, provide the scheduled date for the change:	Month / Day / Year

IX. NAICS Codes (5/6 digit codes)

A. First							B. Second						
5	6	2	2	1	1	Waste Treatment & Disposal	9	2	4	1	1	0	Administration of Air & Water Resource & Solid Waste Management Programs

C. Third							D. Fourth						
5	4	1	7	1	2	Research & Development in the Physical, Engineering, & Life Sciences							

X. Other Environmental Permits (see instructions)

A. Permit Type	B. Permit Number	C. Description
E	AIR-06-1014	WAC 246-247, "Radiation Protection—Air Emissions"
E	AOP00-05-006	Title V Air Operating Permit
E	ST0004511	State Waste Discharge Permit: Miscellaneous Stream Permit

XI. Nature of Business (provide a brief description that includes both dangerous waste and non-dangerous waste areas and activities)

The Waste Encapsulation and Storage Facility (WESF) was constructed on the west end of B Plant between 1971 and 1973 to encapsulate and store radioactive cesium and strontium that had been separated from Hanford Facility radioactive tank waste. The radioactive cesium is stored as cesium chloride, and the strontium is stored as strontium fluoride. WESF has stored the encapsulated salts since operations began in 1974, and mixed waste management activities were initiated on July 14, 1997.

WESF is a two-story, 1,858 m^2 (20,000 ft^2) building that is approximately 48 m (157 ft) long, 30 m (97 ft) wide, and 12 m (40 ft) high. It is constructed of steel reinforced concrete. WESF is partitioned into seven hot cells, the hot cell service area, operating areas, building service areas, and the pool cell area. There are three dangerous waste management units (DWMUs) at WESF: two are operating and one is closing. The two operating DWMUs consist of the Hot Cell G DWMU and the Pool Cells DWMU.

The closing DWMU consists of Hot Cell A through Hot Cell F, which are being filled with grout as part of a legacy contamination stabilization project and ventilation replacement in 2016. The hot cell service area is located on the south side of the hot cells and is used for access into Hot Cells A and G. The operating areas and other building service areas associated with the hot cells provide areas for instrumentation monitoring, utility support, or manipulator repair, as required.

The two operating WESF DWMUs have been classified as X99 storage units due to their unique nature and high radiation content. Classification of the Pool Cells and Hot Cell G DWMUs as miscellaneous units is necessary because the unique radiological characteristics of the cesium/strontium capsules require specialized management systems and requirements other than those applicable to container storage units.

Pool Cells

The WESF pool cell area consists of 12 pools lined with stainless steel. The Pool Cell DWMU consists of Pool Cells 1 through 8 and 12 which can be used for capsule storage and are filled with water to a depth of approximately 4 m (13 ft). Each pool cell is equipped with a monitoring system to detect any leakage from capsules. The water cools the cesium/strontium capsules and provides radiation shielding. Pool Cell 12 is used to move capsules from Hot Cell G and from pool cell to pool cell.

The dangerous waste being managed at WESF is the cesium and strontium capsules stored in the Pool Cells. The waste is stored in stainless steel capsules with a maximum outer height of approximately 53 cm (~21 in.) and maximum diameter of approximately 8 cm (~3 in.).

Pool Cells 9, 10, and 11 are not configured to store capsules; therefore, they are not DWMUs or subject to treatment, storage, and disposal (TSD) requirements under the permit. Pool Cells 9 and 10 were designed to be used for waste water collection (e.g., steam condensate). The waste water was collected in one of these pool cells. When it was full, the water was sampled and then disposed of, typically to the Treated Effluent Disposal Facility. Following deactivation of the steam system, there was very little waste water generated anymore. Pool Cell 11 is dry and contains the resin column for the pool cell ion exchange system.

Hot Cell G

Hot Cell G was used to perform inspections of capsules. Historically, both Hot Cell F and Hot Cell G have been available to support contingency operations in the event of a capsule failure. After closure of Hot Cell F, upon discovery of a suspected failed capsule, the capsule would be brought into Hot Cell G for inspection and testing; it would then be placed into shielded storage pending development of a full recovery plan. Hot Cell G will continue to provide a location for welding and testing should installation of overpacks onto capsules be required. The intended use for Hot Cell G is unchanged; it provides support for the pool cells by storing capsules suspected of leaking and supports loading of capsules into canisters/casks to allow removal of the capsules from WESF. With the addition of shielded storage to Hot Cell G, personnel will have continued access to Hot Cell G while capsules are being stored, thereby eliminating the need for Hot Cell F to remain operational.

Hot Cell A through Hot Cell F

Waste and drum loadout was performed in Hot Cell A during production operations. Hot Cells B through E were used to convert strontium nitrate and cesium carbonate into strontium fluoride and cesium chloride salts. The hot cells were also used to place the salt into capsules along with welding and leak testing of the capsules. Hot Cell F remained operational to support contingency operations in the event of a capsule leak by providing storage of capsules to allow continued personnel access to Hot Cell G but was not used for that purpose. With the addition of shielded storage to Hot Cell G, Hot Cell F has been determined unnecessary for contingency operations and, along with Hot Cell A through Hot Cell E, is proposed for closure.

Storage Capacity Pool Cells

Capsules can be stored in Pool Cells 1, 3, 4, 5, 6, 7, and 12. Pool Cells 2 and 8 are part of the TSD boundary, but there is no capability to store capsules there. Pool Cells 1, 3, 4, 5, 6, and 7 contain engineered devices (capsule storage racks) to store the capsules. Each pool cell contains three racks, with a total storage capacity of 715 capsules

per pool cell. These 6 pool cells can hold 4,290 capsules. Capsules in Pool Cell 12 are not stored in racks (Pool Cell 12 is used for temporary storage only). Therefore, the storage capacity of Pool Cell 12 will be calculated by dividing the area of the Pool Cell 12 floor by the area needed to store each capsule. Without a rack, the capsule will not remain vertical and will be stored lying horizontally on the floor. The following assumptions are made: capsules are stored in a single layer (they are not stacked); each capsule needs a space 10 cm (4 in.) by 61 cm (24 in.) = 610 cm^2 (96 $in.^2$). Existing operational and safety basis limits are not considered as constraints on how many capsules may be stored in Pool Cell 12; Pool Cell 12 is approximately 91 cm (36 in.) wide by 1,950 cm (768 in.) long which equals approximately 177,450 cm^2 (27,650 $in.^2$); 27,650 in^2/96 in^2 = 288 capsules. Therefore, the total storage capacity of Pool Cells 1, 3, 4, 5, 6, 7, and 12 is 4,578 capsules. Assuming 1 L (0.264 gal)/capsule, this equates to 4,578 L (1,209 gal).

Storage Capacity G Cell

Shielded storage will be provided in Hot Cell G to allow storage for leaking capsules but maintain the ability for personnel entry into the hot cell. Shielded storage will hold up to nine capsules. Therefore, the total storage capacity of Hot Cell G is nine capsules. Assuming 1 L (0.264 gal)/capsule, this equates to 9 L (2.38 gal). The total combined storage for the DWMUs is 4,587 L (1,212 gal) (Pool Cells and Hot Cell G combined).

EXAMPLE FOR COMPLETING ITEMS XII and XIII (shown in lines numbered X-1, X-2, and X-3 below):

Section XII. Process Codes and Design Capacities								Section XIII. Other Process Codes								
Line Number		A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	Line Number		A. Process Codes (enter code)			B. Process Design Capacity		C. Process Total Number of Units	D. Process Description
					1. Amount	2. Unit of Measure (enter code)							1. Amount	2. Unit of Measure (enter code)		
X	1	S	0	2	1,600	G	002	X	1	T	0	4	700	C	001	In situ Vitrification
X	2	T	0	3	20	E	001									
X	3	T	0	4	700	C	001									
	1	X	9	9	4,587	L	003		1	X	9	9	4,587	L	003	Storage
	2								2							
	3								3							
	4								4							
	5								5							
	6								6							
	7								7							
	8								8							
	9								9							
1	0							1	0							
1	1							1	1							
1	2							1	2							
1	3							1	3							
1	4							1	4							
1	5							1	5							
1	6							1	6							
1	7							1	7							
1	8							1	8							
1	9							1	9							
2	0							2	0							
2	1							2	1							
2	2							2	2							
2	3							2	3							
2	4							2	4							
2	5							2	5							

XIV. Description of Dangerous Wastes

Example for completing this section: A facility will receive three non-listed wastes, then store and treat them on-site. Two wastes are corrosive only, with the facility receiving and storing the wastes in containers. There will be about 200 pounds per year of each of these two wastes, which will be neutralized in a tank. The other waste is corrosive and ignitable and will be neutralized then blended into hazardous waste fuel. There will be about 100 pounds per year of that waste, which will be received in bulk and put into tanks.

Line Number	A. Dangerous Waste No.				B. Estimated Annual Quantity of Waste	C. Unit of Measure	D. Processes									(2) Process Description [If a code is not entered in D (1)]
							(1) Process Codes									
X 1	D	0	0	2	400	P	S	0	1	T	0	1				
X 2	D	0	0	1	100	P	S	0	2	T	0	1				
X 3	D	0	0	2												Included with above
1	D	0	0	5	4,587	L	X	9	9							Storage
2	D	0	0	6	Included Above	Included Above	X	9	9							Included Above
3	D	0	0	7	Included Above	Included Above	X	9	9							Included Above
4	D	0	0	8	Included Above	Included Above	X	9	9							Included Above
5	D	0	1	1	Included Above	Included Above	X	9	9							Included Above
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																
25																

XV. Map

Attach to this application a topographic map of the area extending to at least one (1) mile beyond property boundaries. The map must show the outline of the facility; the location of each of its existing and proposed intake and discharge structures; each of its dangerous waste treatment, storage, recycling, or disposal units; and each well where fluids are injected underground. Include all springs, rivers, and other surface water bodies in this map area, plus drinking water wells listed in public records or otherwise known to the applicant within ¼ mile of the facility property boundary. The instructions provide additional information on meeting these requirements.

A topographic map of the Hanford Facility is located in the Ecology Library. A topographic map of WESF is included in Attachment A, "Section XVII – Photographs", which contains photographs and figures.

XVI. Facility Drawing

All existing facilities must include a scale drawing of the facility (refer to Instructions for more detail).

XVII. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, recycling, and disposal areas; and sites of future storage, treatment, recycling, or disposal areas (refer to Instructions for more detail).

Photographs are included in Attachment A.

XVIII. Certifications

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Operator Name and Official Title (type or print)		**Date Signed**
Stacy L. Charboneau, Manager U.S. Department of Energy Richland Operations Office		
Co-Operator* Name and Official Title (type or print)		**Date Signed**
John Ciucci President and Chief Executive Officer CH2M HILL Plateau Remediation Company		
Co-Operator – Address and Telephone Number*		
P.O. Box 1600 Richland, WA 99352 (509) 376-0556		
Facility-Property Owner Name and Official Title (type or print)	**Signature**	**Date Signed**
Stacy L. Charboneau, Manager U.S. Department of Energy Richland Operations Office		

XIX. Comments

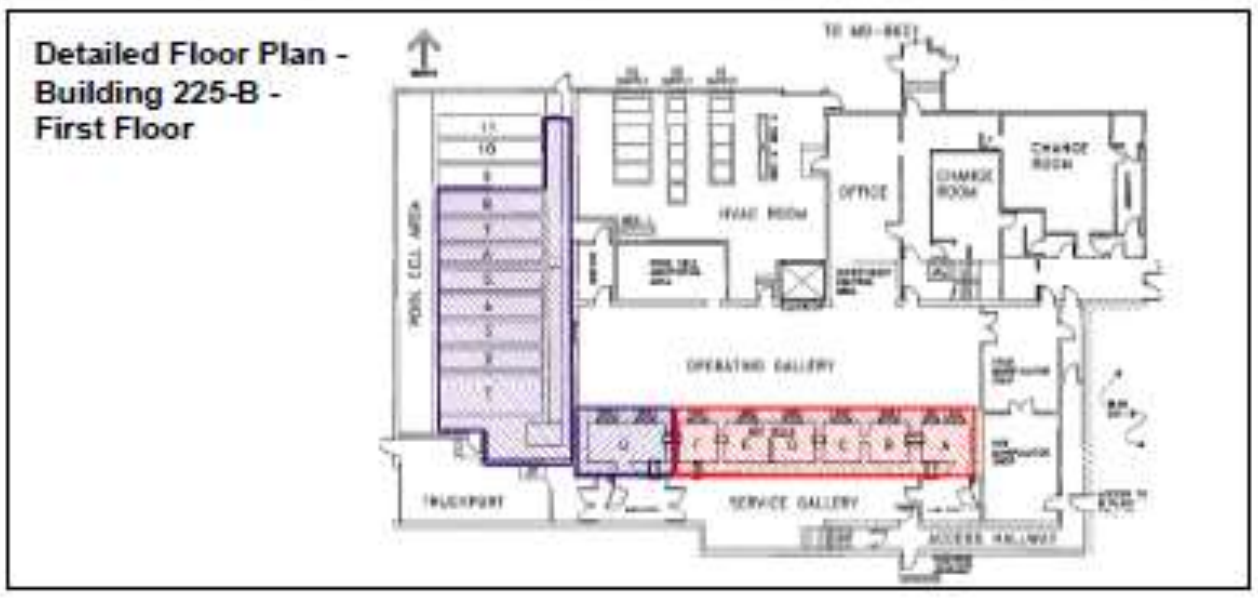
Revision 5 update documents changes to the facility that are necessary to replace the existing ventilation system and stabilize the legacy radioactive contamination in WESF. This revision identifies 3 DWMUs. Two DWMUs will continue to operate, store, and process (Pool Cells 1 through 8 and 12 and Hot Cell G) cesium and strontium capsules. The other DWMU, consisting of Hot Cell A through Hot Cell F, is no longer needed and will undergo extended closure in order to coordinate closure with the remaining DWMUs at WESF. Building diagrams and maps were updated to reflect changes in the DWMUs.

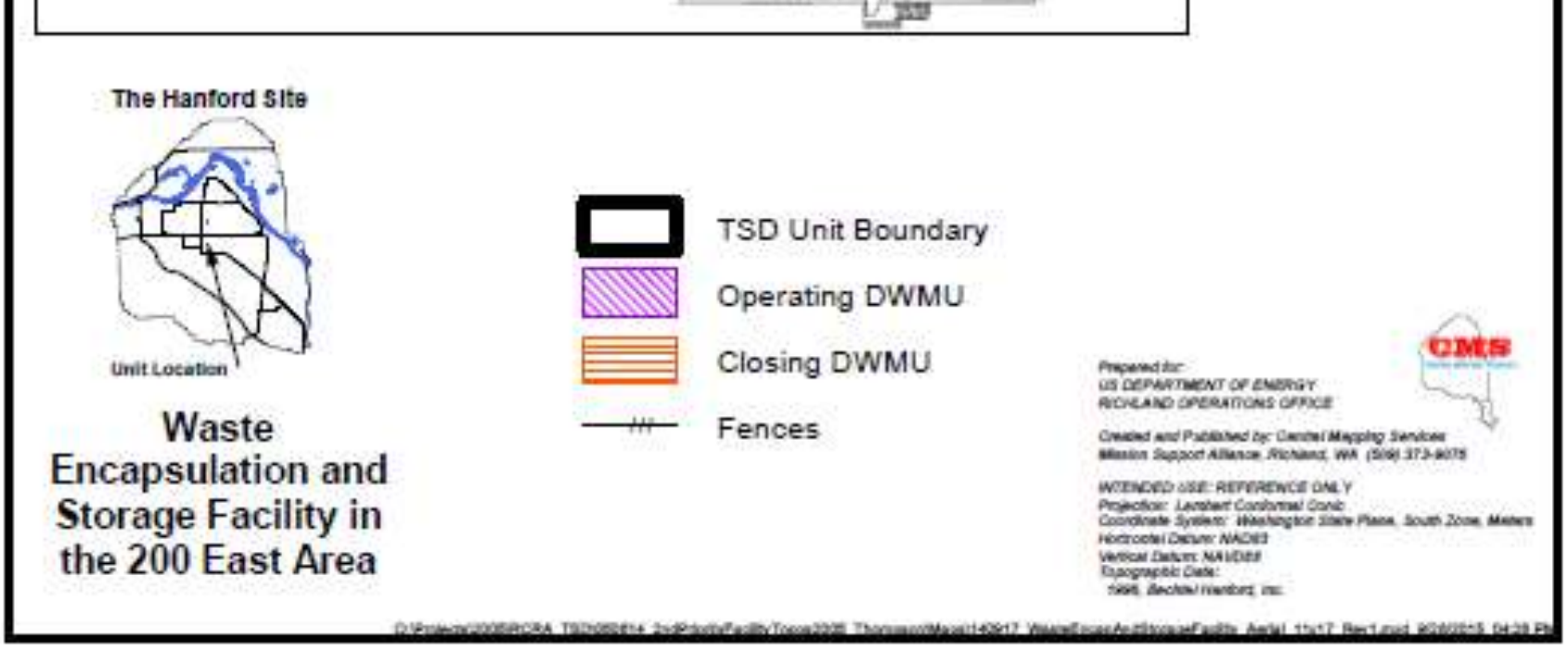
Attachment A contains pictures and topographic maps of WESF.

1

WASTE ENCAPSULATION AND STORAGE FACILITY PART A ATTACHMENT A
SECTION XVII – PHOTOGRAPHS

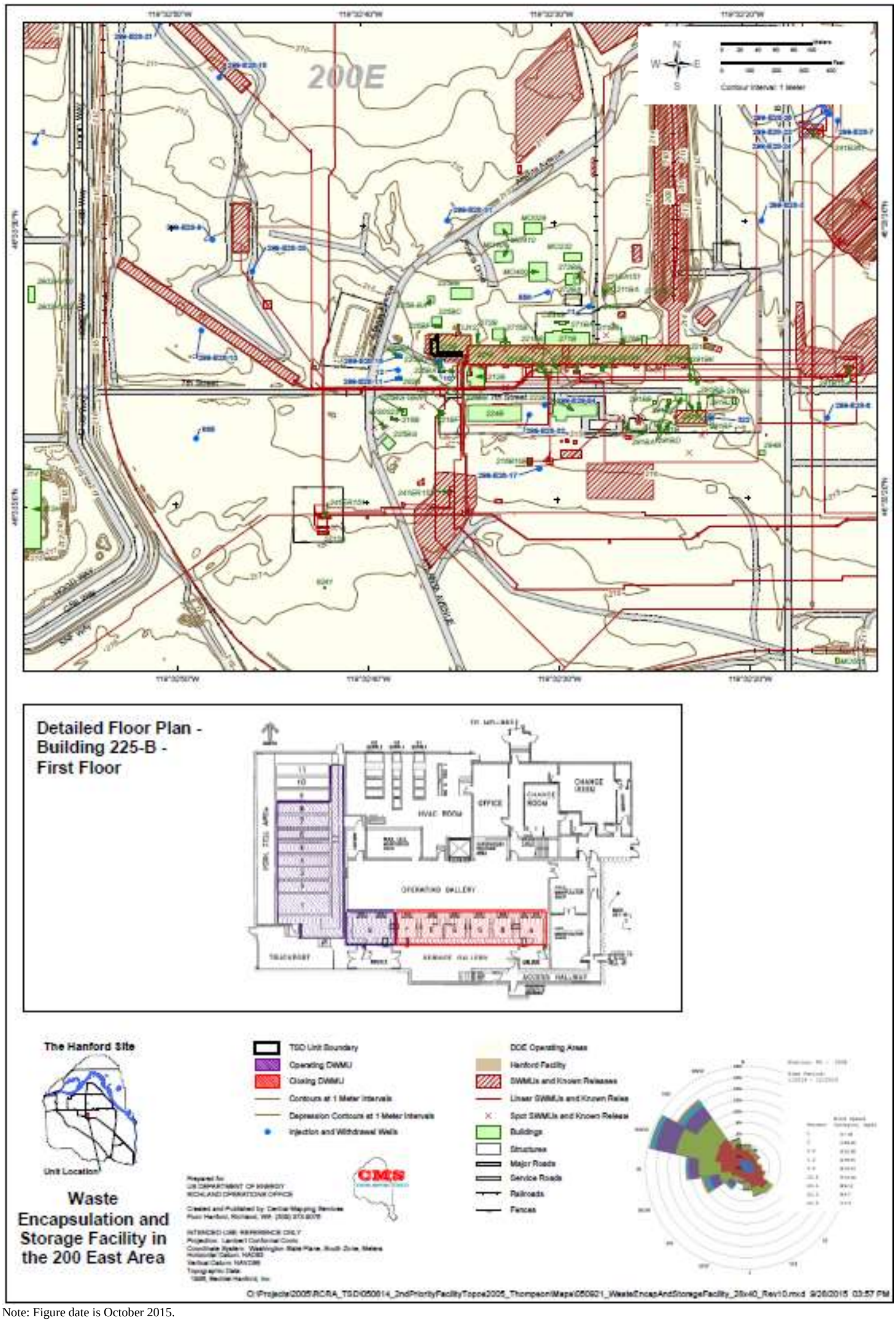
This page intentionally left blank.





Note: Figure date is October 2015.

Figure A-1. WESF Aerial Photo Operating and Closing Units



Note: Figure date is October 2015.

Figure A-2. WESF Topographic Map Operating and Closing Units

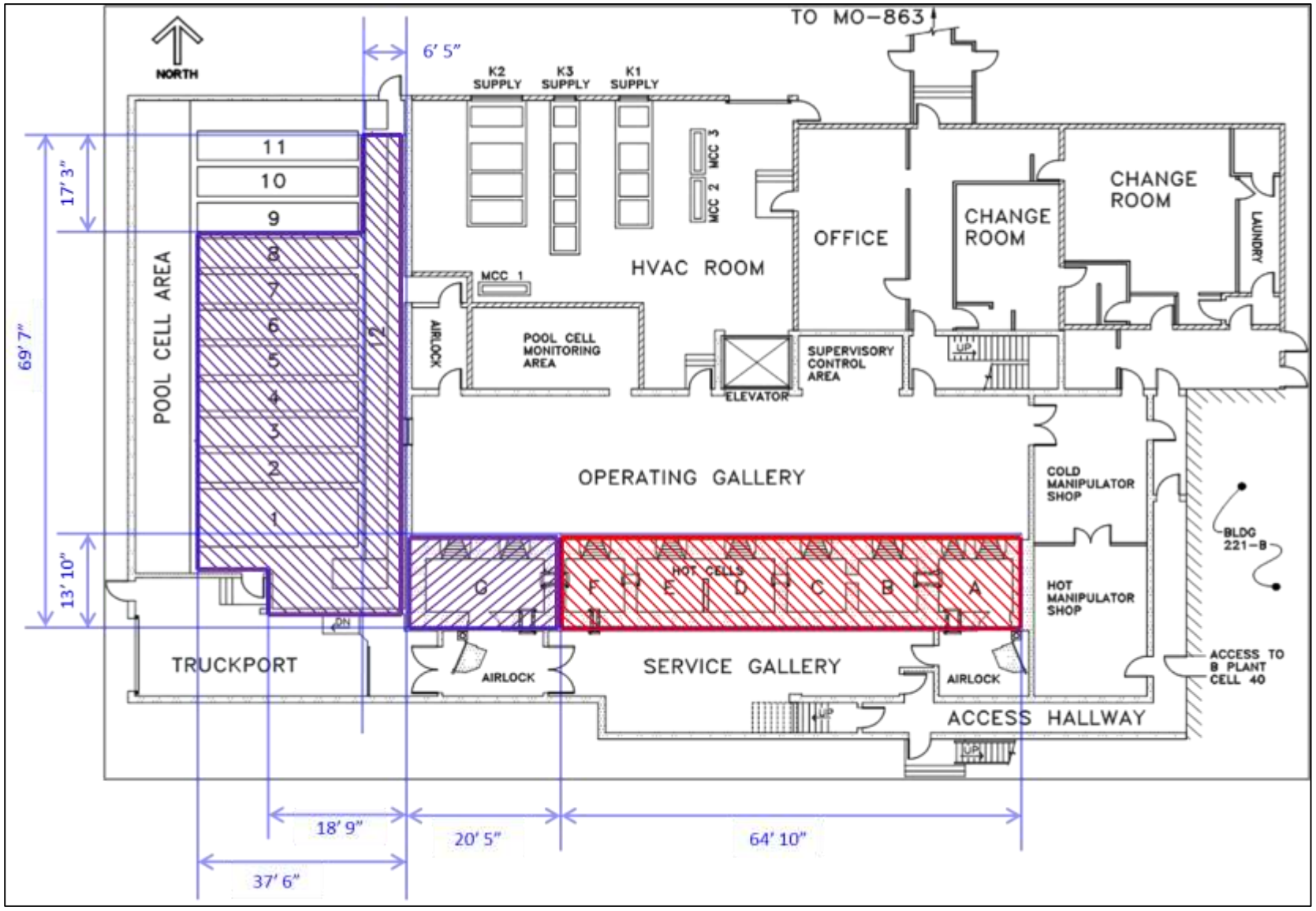


Figure A-3. Map of WESF Pool and Process Cells

Note: Photo was taken in 1997.

Figure A-4. 225-B Building

Note: These photos are undated and reflect the current appearance.

Figure A-5. F Cell

Note: Typical, undated photograph reflects the current appearance.

Figure A-6. C Cell and D Cell

Note: Length example; undated photo reflects the current appearance.

Figure A-7. 221 Hot Cells

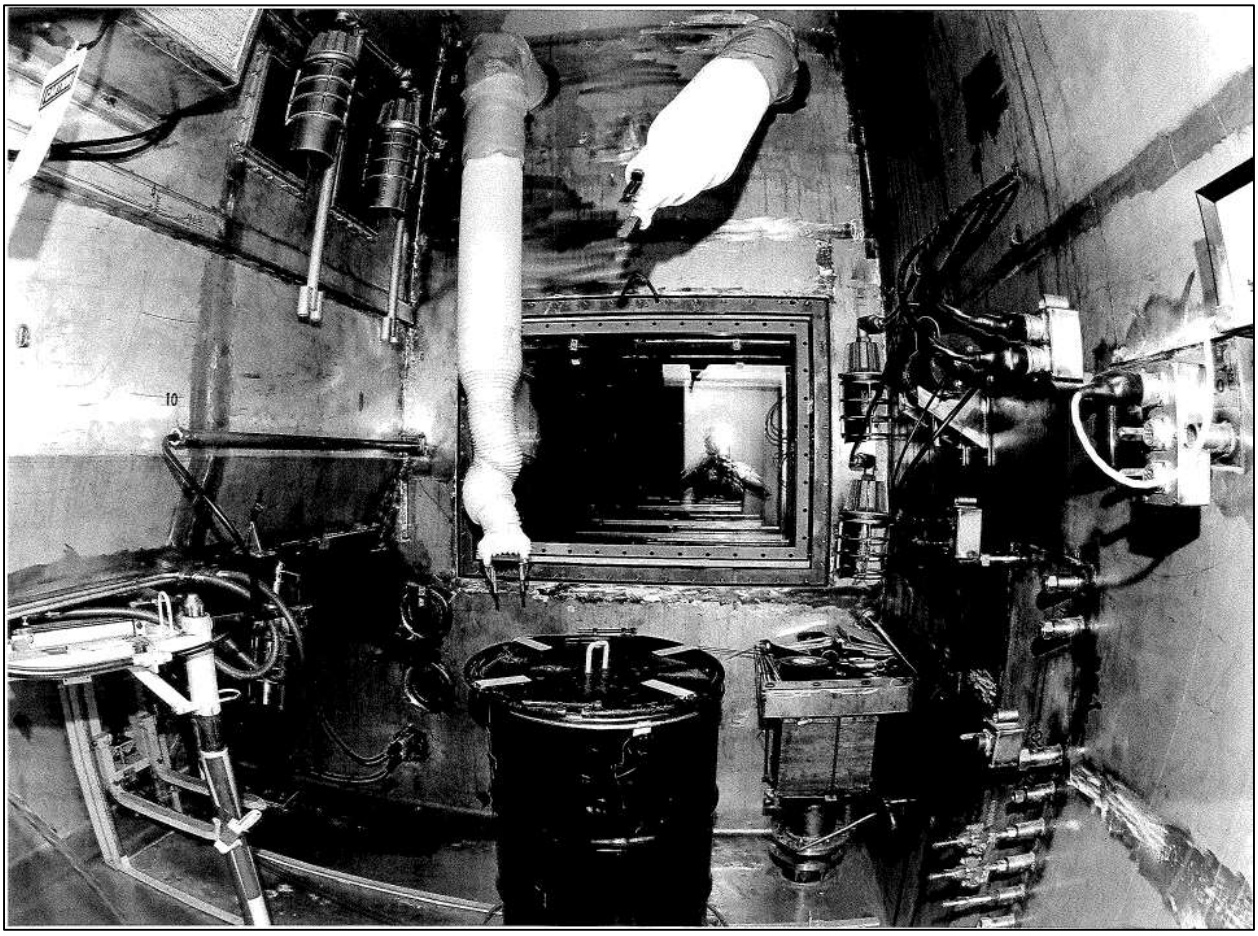
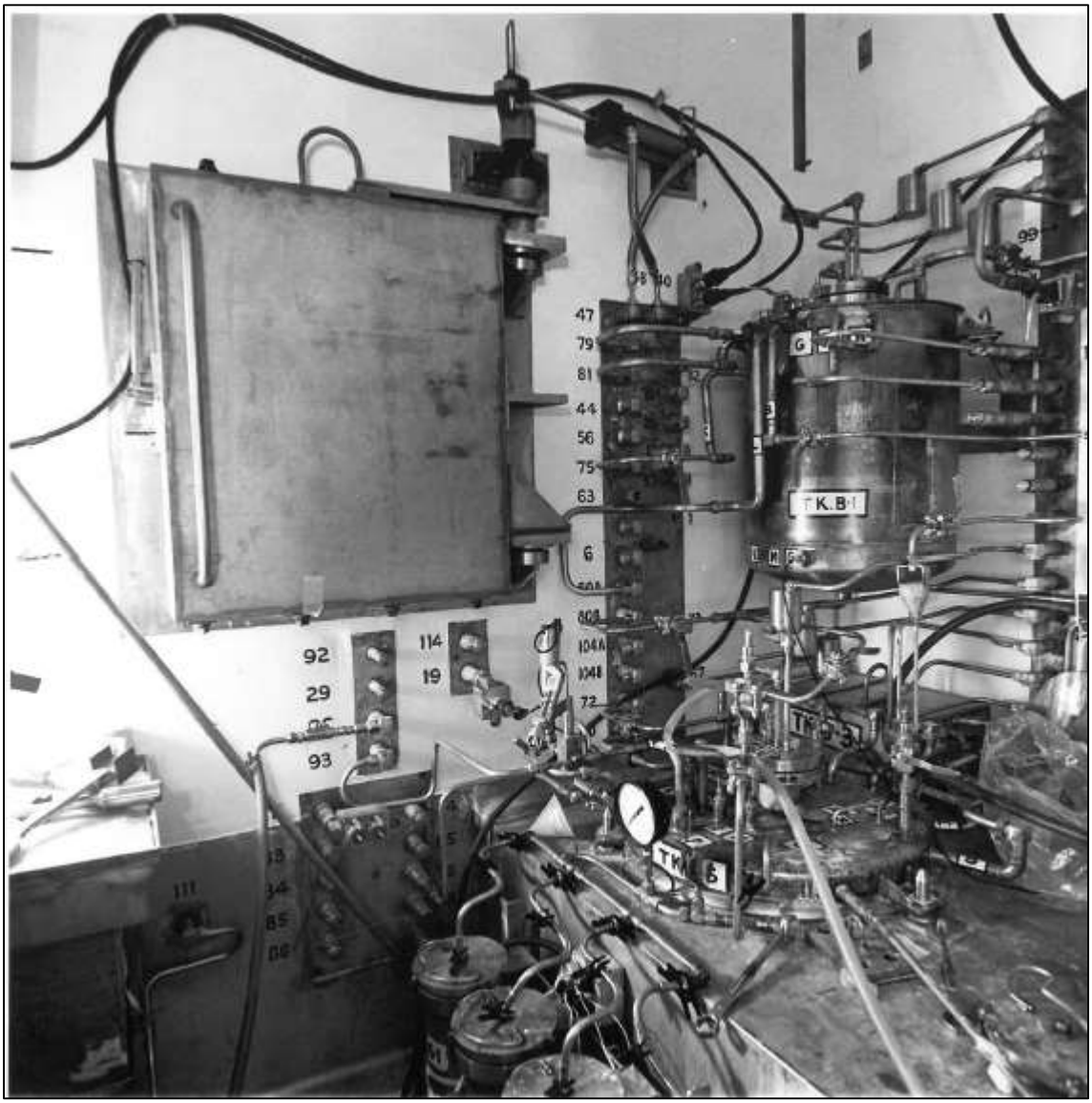
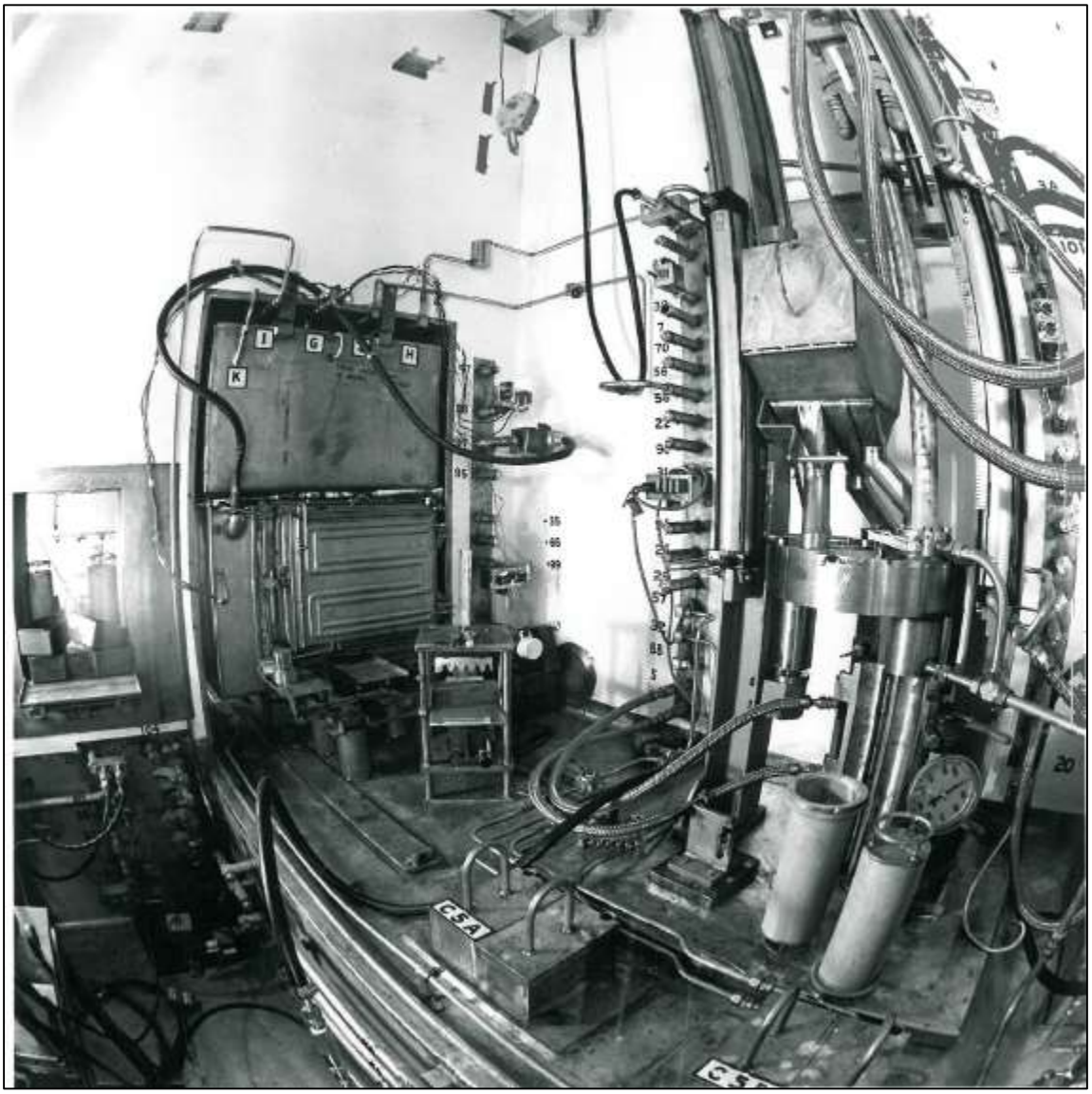


Figure A-8. Hot Cell A Looking North (2006)



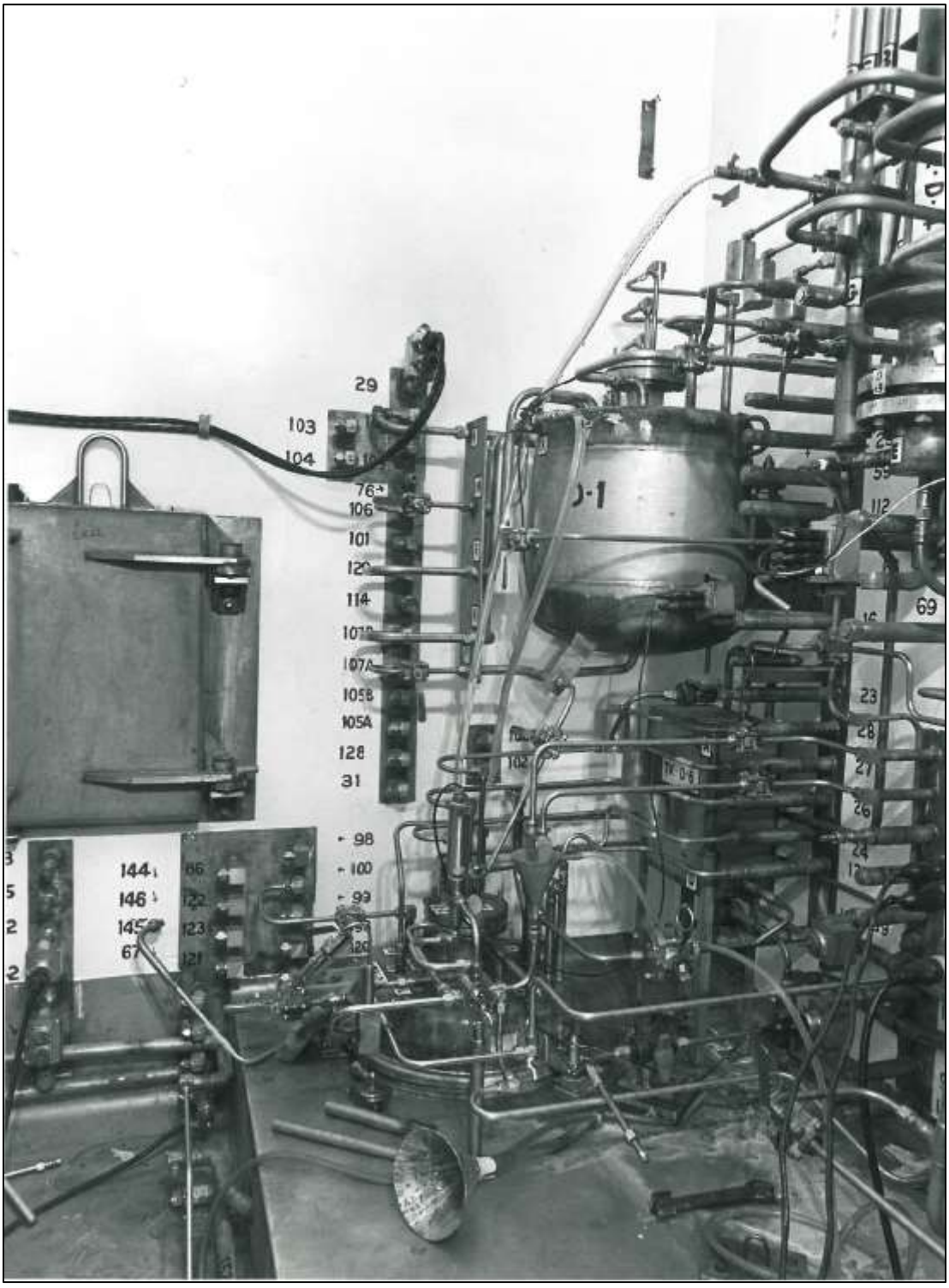
Note: Estimated date of photo is 1973 or 1974.

Figure A-9. Hot Cell B Looking Southeast



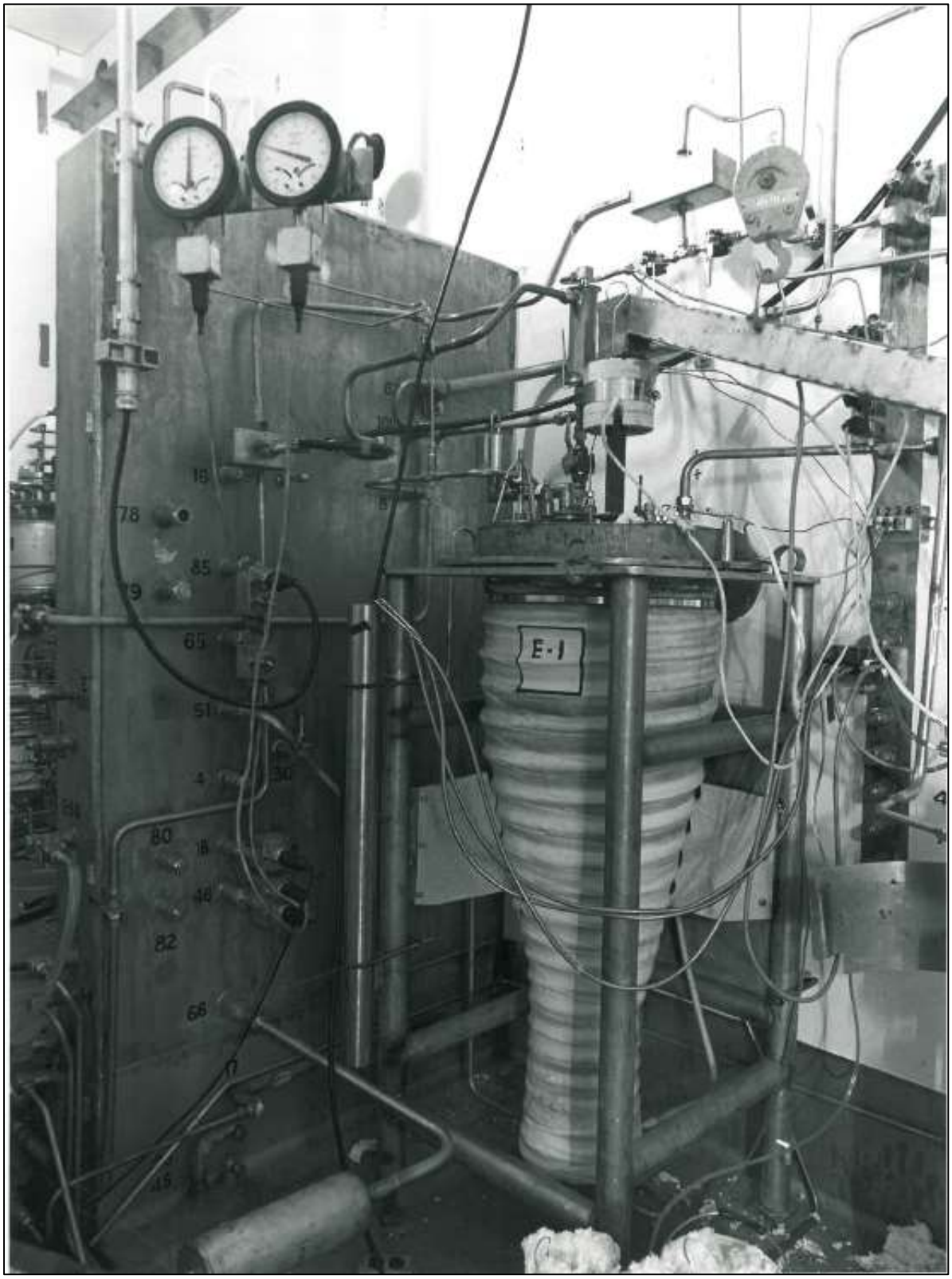
Note: Estimated date of photo is 1973 or 1974.

Figure A-10. Hot Cell C Facing East



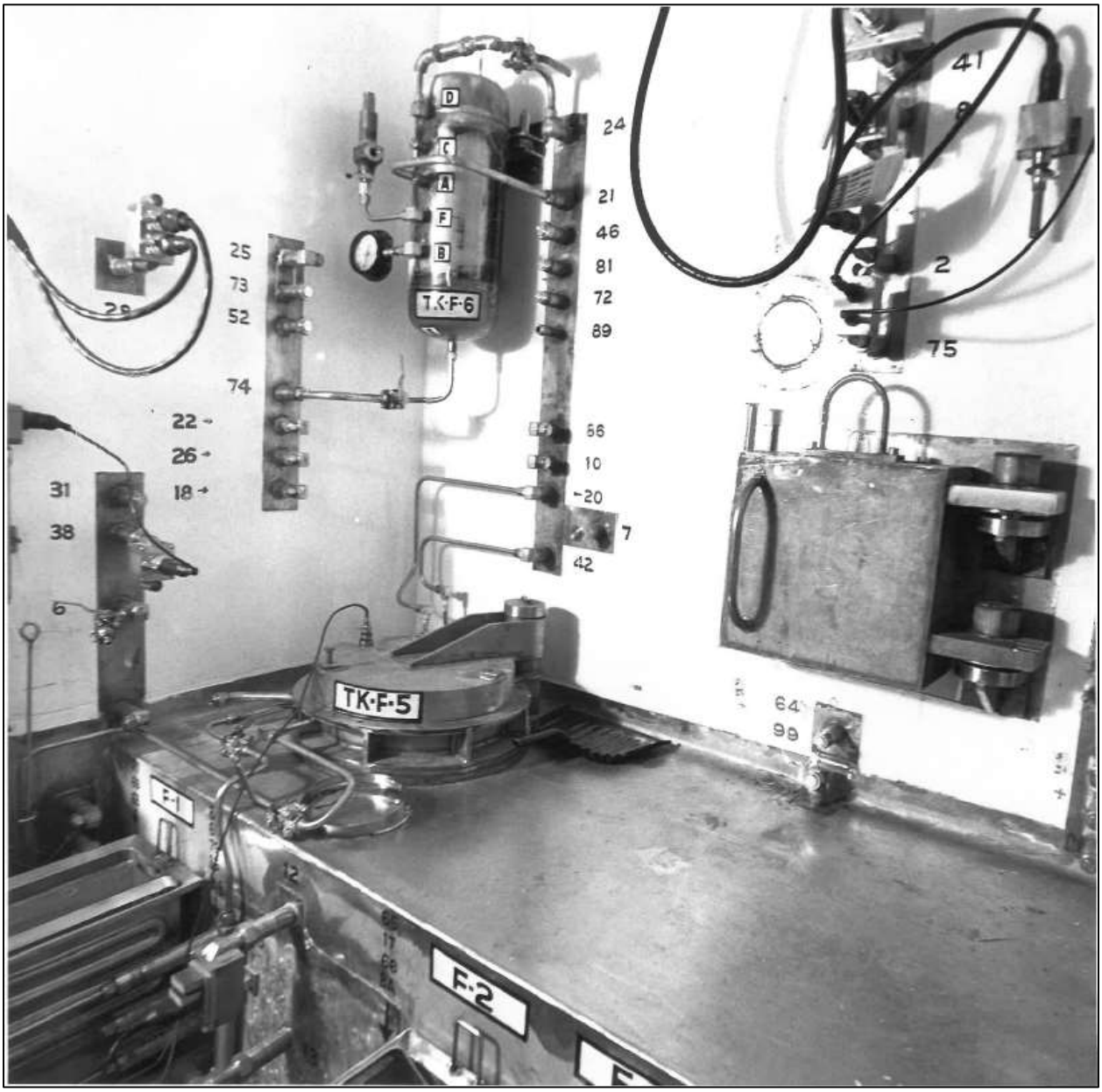
Note: Estimated date of photo is 1973 or 1974.

Figure A-11. Hot Cell D Looking Southeast



Note: Estimated date of photo is 1973 or 1974.

Figure A-12. Hot Cell E Looking Southeast into Hot Cell D



Note: Estimated date of photo is 1973 or 1974.

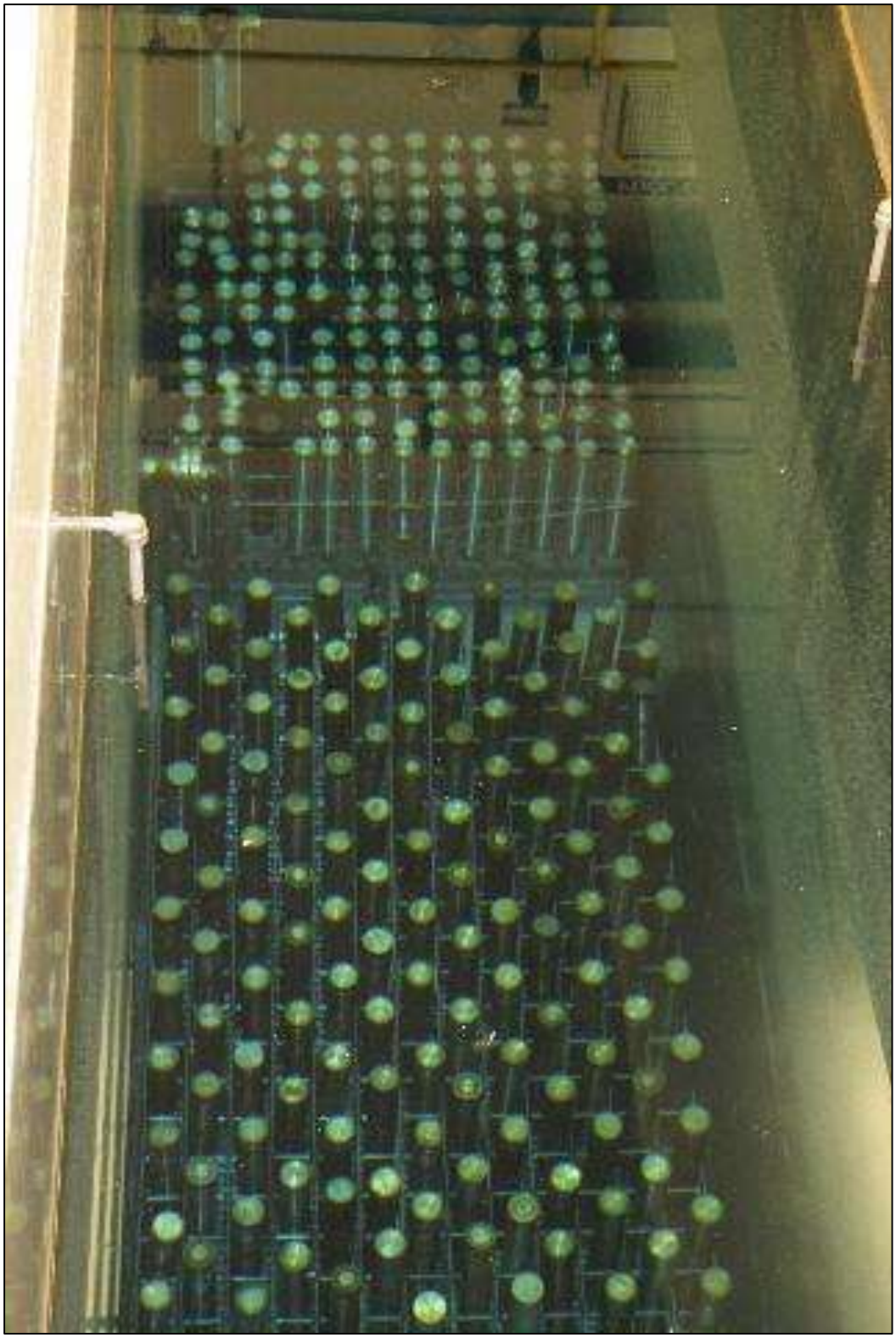
Figure A-13. Hot Cell F Facing Southeast

Note: Moving capsules in June 2012.

Figure A-14. Pool Cells

Note: Top view is from June 2012.

Figure A-15. Pool Cells



Note: Top view is from June 2012.

Figure A-16. Pool Cells