MAR 04 1997

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 605321

2. To: (Receiving Organization) Distribution		3. From: (Originating Organization) T Plant Engineering		4. Related EDT No.: N/A	
5. Proj./Prog./Dept./Div.: Solid Waste Disposal 87430		6. Cog. Engr.: W. John Geuther		7. Purchase Order No.: N/A	
8. Originator Remarks: This Engineering Data Transmittal serves to route document WHC-SD-WM-ER-595, <u>Technical Basis for Removal of 221-T Tunnel From Airborne Radiological Area Status</u> , for final review, approval, and release. The USQ Screening/Evaluation for this proposed change has been performed under USQ # T-96-074.				9. Equip./Component No.: N/A	
				10. System/Bldg./Facility: 221-T Tunnel	
11. Receiver Remarks: <i>Design Baseline Document</i> ☒ yes ☒ no				12. Major Assm. Dwg. No.: N/A	
				13. Permit/Permit Application No.: N/A	
				14. Required Response Date:	

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-WM-ER-595 HJWF CMB 4/4/97		0	Technical Basis for Removal of 221-T Tunnel From Airborne Radiological Status	S	1/2		

16. KEY											
Approval Designator (F)		Reason for Transmittal (G)				Disposition (H) & (I)					
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)		1. Approval		4. Review		1. Approved		4. Reviewed no/comment			
		2. Release		5. Post-Review		2. Approved w/comment		5. Reviewed w/comment			
		3. Information		6. Dist. (Receipt Acknow. Required)		3. Disapproved w/comment		6. Receipt acknowledged			
17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)								(G)	(H)		
Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
1	/	Cog.Eng. WJ Geuther	<i>WJ Geuther</i>	4/1/97	T3-28	RADCON EJ Adams	<i>EJ Adams</i>	4/1/97	T4-06	1	/
1	/	Cog. Mgr. TL Erickson	<i>TL Erickson</i>	4/1/97	T3-28						
		QA				LT Blackford			T3-28	3	
1	/	Safety T Nishioka	<i>T Nishioka</i>	4/1/97	T3-05	MR Fishburn			T4-06	3	
		Env.				WT Frisbee			T3-20	3	
1	/	RADCON RB Swallow	<i>RB Swallow</i>	4/1/97	T3-20	SH Norton			T3-28	3	
1	/	RADCON JR Ellis	<i>JR Ellis</i>	4/1/97	T3-20						
18. WJ Geuther <i>WJ Geuther</i> Signature of EDT Originator		19. <i>TL Erickson</i> <i>TL Erickson</i> Authorized Representative Date for Receiving Organization		20. TL Erickson <i>TL Erickson</i> Cognizant Manager Date		21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments					

Technical Basis for Removal of 221-T Tunnel from Airborne Radiological Area Status

Jackson R. Ellis

Westinghouse Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: EDT 605321 UC: 607
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Key Words: radiological, airborne, respiratory, protection, tunnel,
exposure, contamination

Abstract:

This document provides the technical basis for removal of the 221-T Tunnel from airborne radiological control. T Plant Radiological Control has evaluated air sampling data and engineering controls, and determined the necessary administrative controls to make this transition. With these administrative controls (specified within document) in place, the tunnel can be removed from Airborne Radioactive Area status. The removal of the tunnel from airborne status will allow work to be performed within the tunnel under controlled conditions, as outlined in this technical basis, without the use of respiratory protection equipment.

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Release Approval

3/4/97
Date

Approved for Public Release

TECHNICAL BASIS FOR REMOVAL OF 221-T TUNNEL
FROM AIRBORNE RADIOLOGICAL AREA STATUS
HNF-SD-WM-ER-595

SUMMARY

T Plant Radiological Control has evaluated the 221-T Tunnel for removal from airborne radiological control. The removal of the tunnel from airborne status will allow work in the tunnel under controlled conditions, as outlined in this technical basis, to be performed without the use of respiratory protection equipment. T Plant Radiological Control has evaluated air sampling data and engineering controls, and determined the necessary administrative controls to make this transition. With these controls in place, the tunnel can function as a non-airborne radioactive area.

HISTORY

The 221-T Railroad Tunnel is an access route to allow railcars an avenue to the 221-T Canyon. The tunnel is located at the North end of the 221-T Canyon and is situated at a right angle to the canyon at a level below the canyon. The roof of the tunnel contains a 28' by 16' opening to the floor of the canyon.

The Hanford Site Radiological Control Manual (HSRCM-1), Table 2-4 states the criteria for posting an Airborne Radioactivity Area is > 10% Derived Air Concentration (DAC). The downgrading of radiological controls for the tunnel can be accomplished due to its history of remaining below airborne limits while work was being performed in the canyon that caused airborne levels in excess of these limits. The attached graph (Attachment 1) contains air samples from the weeks of 4/25/95 through 4/10/96 for the continuous air monitor (CAM) that is located in the tunnel. The graphs demonstrate that the tunnel air did not exceed 10% of the DAC for alpha or beta airborne contamination. Airborne radioactive sample data (data analyzed from 1/96 to 4/96) demonstrates that the canyon air has exceeded 10% of the DAC for alpha or beta airborne contamination while the tunnel has remained below these levels (Attachment 2).

REQUIREMENTS

HSRCM-1, Article 136 states, "In order to minimize internal exposures, managers should take deliberate actions to control contamination at the source and reduce Airborne Radioactivity, Contamination and High Contamination Areas. Work should be planned to avoid the routine use of respiratory protection devices." The HSRCM-1 also gives the following direction for control of internal exposure to radiological workers:

316 Minimization of Internal Exposure

The minimization and control of internal exposure as discussed in Article 136 should be conducted in accordance with the following hierarchy of controls:

1. Engineering controls, including containment of radioactive material at the source wherever practicable, should be the primary method of minimizing airborne radioactivity and internal exposure to workers.
2. Administrative controls, including access restrictions and the use of specific work practices designed to minimize airborne contamination, should be used as the secondary method to minimize worker internal exposure.
3. When engineering and administrative controls have been applied and the potential for airborne radioactivity still exists, respiratory protection should be used to limit internal exposures. Use of respiratory protection should be considered under the following conditions:
 - a. Entry into posted Airborne Radioactivity Areas
 - b. During breach of contaminated systems or components
 - c. Work in areas or on equipment with removable contamination levels greater than 100 times the values in Table 2-2
 - d. During work on contaminated or activated surfaces with the potential to generate airborne radioactivity.

In an effort to optimize the efficiency of work in the T Plant 221-T Tunnel, and to comply with the above requirements, T Plant management has initiated a plan to downpost the Tunnel from airborne radiological control status. Steps have been taken to characterize the contamination levels in the Tunnel, evaluate the engineering controls already in place, and update administrative controls for entry and work in the Tunnel.

CHARACTERIZATION OF TUNNEL

Contamination surveys were performed in the tunnel and the survey reports (Attachment 3) show that removable contamination levels are not above 100 times the values of HSRCM-1, Table 2-2 (requirement from HSRCM-1 316.3).

ENGINEERING CONTROLS

The ventilation system of the canyon pulls outside air through the tunnel from around its doors, and into the canyon through the 28' by 16' opening. Internal Memo, 33541-96-RBS-002, AIR FLOW PATTERNS IN THE 221-T TUNNEL (Attachment 4), discusses the use of ventilation as a barrier against airborne contamination from the canyon entering the tunnel. The air flow study was repeated with the railcar door completely opened and with a railcar present on May 30, 1996, and the test showed that the air flow was from the tunnel to the canyon in all cases. The latter test also demonstrated that the drain in the floor of the tunnel did not affect the air flow.

The roof exhaust fan for the canyon is isolated and is no longer functional as an airflow/emission point. Air flow with this system operating was not considered for this downposting. Supply fans in the canyon are usually not operated. Air flow studies were not conducted with these fans operating. The tunnel will be controlled as an airborne area if these fans are operating until the air flow study can be repeated with them turned on.

The activities that caused the air concentration in the canyon to exceed 10 % DAC in 1996 (see Attachment 2) were cutting of contaminated ductwork at Section 10 and auger decontamination activities at Section 15. These activities are conducted > 300 and > 500 feet away from the tunnel entry area, respectively. The auger decontamination activities are usually performed daily for approximately 4 hours each day. Air sampling is performed at the location of auger decontamination.

ADMINISTRATIVE CONTROLS

The engineering controls are supplemented with administrative controls described in T Plant Plant Operating Procedures (POP), Radiological Work Permits (RWP), work control reviews, and Radiological Control routine tasks. Administrative controls to be utilized include:

Access under normal conditions from the canyon to the tunnel and vice versa will not be allowed. Special considerations will be made for individual jobs where these accesses are needed. These are controlled with radiological postings and RWPs.

Activities in the tunnel where respiratory protection is utilized will require the entire tunnel will be posted as an Airborne Radioactivity Area. These are controlled with radiological postings and RWPs. Downposting survey plans will be used to return the tunnel to its normal status.

Once the tunnel is downposted, routine surveys will be performed to ensure that removable contamination is not present that could cause airborne contamination. This is implemented by in routine T-W010, Contamination and Dose Rate Survey of Tunnel.

The area in the canyon around the tunnel entry will be routinely surveyed for removable contamination to ensure contaminated debris from

the canyon does not fall into the tunnel. This is covered in routine T-W011, Contamination and Dose Rate Survey of Canyon Craneway Opening and PWR Pool Area.

Controls will be used to ensure that the crane hook is not lowered into the tunnel with removable contamination levels greater than 100 times the values of Table 2-2 (HSRCM-1) of contamination on it. This is controlled by the Crane Procedure DO-021-029, which contains a step that requires a contamination survey of the hook to ensure levels as described on the RWP are not exceeded.

Controls will be used to ensure that non-routine jobs that could potentially cause increased levels of airborne contamination (e.g. movement of cell block covers on highly contaminated cells) are not performed in the canyon North of the Section 10 (~300 feet from tunnel entrance) with the tunnel "off mask." Work control and RWPs will control these individually as they are performed.

Controls will be used to ensure that the tunnel is not off mask if failure of the canyon ventilation system occurs. Evacuation of the tunnel is required in the event of a low pressure alarm as described in ARP-D-463-00002 Respond to 221-T, 221-T52, & 291-T Alarms. Returning to normal operation condition will occur as part of emergency recovery depending on circumstances.

Work place air sampling for the tunnel will include continuous air monitoring to alert personnel for increases in the airborne concentration. An air sampler will be used to obtain a record air sample. Grab samples will taken for specific jobs to determine airborne concentrations during work.

Canyon ventilation supply fans will be locked and tagged out of service to prevent operation while personnel without respiratory protection are in the tunnel.

CONCLUSION

T Plant Radiological Control has evaluated the 221-T Tunnel for removal from airborne radiological control. T Plant has implemented the necessary controls described in this Technical Basis. With these controls in place, the tunnel can function as a non-airborne radioactive area.

00 | TUNNEL

OO | TUNNEL

001

(The Dates are projected TIME OFF Dates of the air samples)

T Plant Air Sample Data for Section 15 of Canyon and Tunnel

Westinghouse Hanford Company - Radiological Control				Survey No. Nº 243840						
RADIOLOGICAL SURVEY REPORT										
Date 6/19/96		Time 0900-1530		RWP No.(s) T-115						
Area/Bldg./Room/Location (Code) 72W/221-T/TUNNEL/ROLL UP DOOR AREA					Page 1 of 2					
Job Description INVESTIGATIVE SURVEY OF TUNNEL FLOOR, WALLS, AND DOORS AT SECTION A.					F.C. T					
Purpose of Survey (check appropriate box(es)):										
Contamination Incident: ☐ Skin, ☐ Clothing, ☐ Spill										
Alarm Response: ☐ CAM, ☐ ARM(RAM), ☐ PSD										
☐ HRA/VHRA Work ☒ Job Coverage ☐ Other										
☐ Exposure Incident ☐ Material Release										
☐ RM Transfer/Shipment ☐ Required, Task No. N/A										
Map/Sketch										
No.	Description	Dist.	DOSE RATE			CONTAMINATION LEVELS				
			S (non-pen) mrad/h	Y (pen) mR/h	I mrem/h	Direct (dpm/probe)		Smear (/100cm ²)		
						S	α	S (dpm)	α (dpm)	mrad/h
1.	WALL SURVEYS	N/A					N/A	<1K	<D	N/A
2.	WALK THRU DOOR							<1K	<D	
3.	ROLL UP DOOR							<1K	<D	
4.	IN BETWEEN TRACKS ^{TRUCK}							3K	<D	
5.	FLOOR (2)							2K	<D	
6.	FLOOR (3)	N/A						4K	<D	
7.	GULLY AT (4)	C	4	20.5	N/A					
N/A										
N/A										
N/A										

Continued on page 2

Air Sample Results (uCi/ml)				Legend	
	BZ	GA	Initial	Decay	(#) - Smear Location (Δ) - Air Sample Location [■] - Large Area Smear * - Contact Reading Other N/A
1	N/A	✓	4.8E-14	N/A	
8	1	✓	4.9E-13		
2	N/A				
8	N/A				

Survey No. N^o 243840

[illegible]

PAINT IN Gully IS STILL WET UNABLE TO OBTAIN SMears. CD IS NO ANTIKNE
PITS WERE OBSERVED. BATH CAN WAS LOCATED 45 FEET FROM ROLLUP
DOOR. WHEEL SURVEYS WERE FROM FLOOR TO 18 FEET HIGH. /

٧١

Instr./Probe Model	RO-38 (CP)	E140/Pancake (GM/Probe)	PAM	BETA CAM	N/A	N/A	N/A
Serial No.	6303	1485/0183	2408	4108			
Efficiency	100%	15%	14%	N/A			
Correction Factor		10	7	1			

Sample Counter (oo/s) T-061619915-101

Sample Counter (oo/s) T-061619915-101

RPR No.	N/A
SSR No.	A
Sample Counter Log(s)	T-06191996-101
Contamination - Skin	N/A

RSR No. Contamination - Skin NA Procedure: NA

Contamination - Clothing	Other(s)
2/A	

First-Line HP Manager: _____

Payroll No.: 81470/55830 Date: 6-20-96

Name (Print): STON / KIM TONIES

Name (Print): Bick

Name (Print): Sivalli

Signature: [Signature]
Name (Print): [Signature]

Westinghouse Hanford Company - Radiological Control
RADIOLOGICAL SURVEY REPORT

Attachment Survey No. 243849

Date 6/20/96 Time 0830-1130 RWP No.(s) T-115 Page 2 of 11 F.C. 7

Area/Bldg./Room/Location (Code)

2W/ZZI-T/TUNNEL/SECTION B

Job Description

SURVEY OF SECTION B
IN THE TUNNEL.

Purpose of Survey (check appropriate box(es)):

Contamination Incident: ☐ Skin, ☐ Clothing, ☒ Spill

Alarm Response: ☐ CAM, ☐ ARM(RAM), ☒ PSD

☐ HRA/VHRA Work ☒ Job Coverage ☐ Other

☐ Exposure Incident ☐ Material Release

☐ RM Transfer/Shipment ☐ Required, Task No. N/A

N/A

Map/Sketch

No.	Description	Dist.	DOSE RATE			CONTAMINATION LEVELS				
			B (non-pen) mrad/h	γ (pen) mR/h	n mrem/h	Direct (dpm/probe)		Smear (/100cm ²)		
						B	α	B (dpm)	α (dpm)	mrad/h
1.	FLOOR #1	N/A						3K	CD	N/A
2.	IN BETWEEN TRACKS #2	N/A						5K	CD	
3.	FLOOR #3	N/A						4K	CD	
4.	GUTTER	C 3		20.5	N/A					
5.	TRACKS	N/A						5K	CD	N/A
6.	SOUTH WALL	N/A						6K	CD	
7.	NORTH WALL	N/A						<1K	CD	
N/A										
N/A										
N/A										

Continued on page 2

Air Sample Results (μCi/ml)

	BZ	GA	Initial	Decay
α 1	N/A	✓	1.2E-12	N/A
B 1		✓	2.2E-12	
α 2	N/A		N/A	
B 2				

Legend

⊙ - Smear Location ⊠ - Air Sample Location

⊞ - Large Area Smear * - Contact Reading

Other N/A

Survey No. 243849

Comments

Samples Counted with portable instruments for N/A minutes.

ADDITIONAL REPORTS

HPT:

Payroll No.: 81470

Name (Print): Don Lee

Signature:

First-Line HP Manager:

Date: 6/25/96

Payroll No.: 84887

Name (Print): J R E / 1.5

Signature:

Westinghouse Hanford Company - Radiological Control				Survey No. Nº 243852																																																																																																																																																	
RADIOLOGICAL SURVEY REPORT																																																																																																																																																					
Date 6-20-96	Time 1700	RWP No.(s) T-230		Page 1	of 23																																																																																																																																																
Area/Bldg./Room/Location (Code) 200W/271T/Tunnel/08				F.C. T																																																																																																																																																	
Job Description Survey of tunnel for clean up and decontamination			Purpose of Survey (check appropriate box(es)): Contamination Incident: ☐ Skin, ☐ Clothing, ☐ Spill Alarm Response: ☐ CAM, ☐ ARM(RAM), ☐ PSD ☐ HRA/VHRA Work ☒ Job Coverage ☐ Other ☐ Exposure Incident ☐ Material Release ☐ RM Transfer/Shipment ☐ Required, Task No. _____																																																																																																																																																		
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8			N/A	N/A																																																																																																																																																	

WHC - Radiological Control		RADIOLOGICAL SURVEY REPORT		F.C. <u>T</u>	Page <u>2</u> of <u>3</u>	Survey No. <u>243852</u>																														
No.	Description	Dist.	DOSE RATE			CONTAMINATION LEVELS																														
			S (non-pen) mrad/h	T (pen) mR/h	Direct (dpm/probe)																															
11	N. Wall Sec. F	N/A																																		
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13	S. Wall Sec. D	N/A																																		
14	S. Wall Sec. D	N/A																																		
15	S. Wall Sec. D	N/A																																		
16	S. Wall Sec. D	N/A																																		
17	Fire Extinguisher	N/A																																		
18	S. Wall Sec. E	N/A																																		
19	S. Wall Sec. E	N/A																																		
20	S. Wall Sec. E	N/A																																		
<p>← $< D$ means < Detectable or no levels above background levels of $\geq$ audible pops/minute. Item #5 33-38 were tech smears all others were gross smear (large area wipes).</p>																																				
<p>Samples Counted with portable instruments for <u>N/A</u> minutes.</p>																																				
<p>ADDITIONAL REPORTS</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Model</th> <th>Inst./Probe</th> <th>Serial No.</th> <th>Efficiency</th> <th>Correction Factor</th> </tr> <tr> <td>RO-38</td> <td>(CP)</td> <td>6451</td> <td>100</td> <td>1</td> </tr> <tr> <td>E-140/Pancake</td> <td>(GM/Probe)</td> <td>1942/1576</td> <td>10</td> <td>10</td> </tr> <tr> <td>PKM</td> <td></td> <td>2416</td> <td>14</td> <td>7</td> </tr> <tr> <td>CAM</td> <td></td> <td>408</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Tubed mobile</td> <td></td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> </table>							Model	Inst./Probe	Serial No.	Efficiency	Correction Factor	RO-38	(CP)	6451	100	1	E-140/Pancake	(GM/Probe)	1942/1576	10	10	PKM		2416	14	7	CAM		408	N/A	N/A	Tubed mobile		N/A	N/A	N/A
Model	Inst./Probe	Serial No.	Efficiency	Correction Factor																																
RO-38	(CP)	6451	100	1																																
E-140/Pancake	(GM/Probe)	1942/1576	10	10																																
PKM		2416	14	7																																
CAM		408	N/A	N/A																																
Tubed mobile		N/A	N/A	N/A																																
<p>RPR No. <u>N/A</u> Sample Counter Log(s) <u>N/A</u></p> <p>RSR No. <u>N/A</u> ... Contamination - Skin <u>N/A</u> Others <u>N/A</u></p> <p>HPT: ... Contamination - Clothing <u>N/A</u></p>																																				
<p>Payroll No.: <u>66659</u> Date: <u>6-21-90</u> First-Line HP Manager: <u>Rick Sullivan</u></p> <p>Name (Print): <u>William J. Ricketts / Loren Martin</u> Signature: <u>William J. Ricketts / Loren Martin</u></p>																																				

Westinghouse Hanford Company - Radiological Control

N^o 243851

Radiological Survey Report

Attachment 3
Page 4 of 11

Date 6/20/96 Time 1300/1530 RWP No. (s) 7-115 Rev 00 Page 1 of 2 F.C.

Area/Bldg./Room/Location (Code) 200W/221.1/Tunnel/294/1530

Job Description
Smear survey of Tunnel floor, walls + track at Sec C labeled on floor to insure area to be more suitable (Zone reduction) at Sec C

Map/Sketch

Purpose of Survey (check appropriate box(es)):
Contamination Incident: ☐ Skin, ☐ Clothing, ☐ Spill
Alarm Response: ☐ CAM, ☐ ARM(RAM), ☐ PSD
☒ Other
RM Transfer/shipment ☐ Required, Task No. ☐ Material Release
Exposure Incident ☐ HRA/VHRA Work ☐ Job Coverage

No.	Description	Dist.	DOSE RATE				CONTAMINATION LEVELS			
			β (non-pen) mrad/h	γ (pen) mR/h	α mrem/h	β (dpm/probe)	α (dpm)	β (dpm)	α (dpm)	Smear (1/100cm ²)
1	Survey of Sec C floor	—	—	—	—	—	—	—	—	—
2	DR of Trench	—	—	—	—	—	—	—	—	—
3	DR of Sec C	—	—	—	—	—	—	—	—	—
4	Survey of Tracks Sec C	—	—	—	—	—	—	—	—	—
5	Survey of North East Wall	—	—	—	—	—	—	—	—	—
6	Survey of South West Wall	—	—	—	—	—	—	—	—	—

Legend
 # - Smear Location
 # - Large Area Smear
 # - Contact Reading
 # - Air Sample Location
 Other: $DR = dose rate$

Air Sample Results (μCi/ml)
 BZ GA Initial Decay
 1 1.3E-12 N/A
 2 1.3E-12 N/A
 3 2.2E-12 N/A
 4 2 N/A
 5 2 N/A
 6 2 N/A

Continued on page 2

Survey No. **N^o 243851**

Comments

Secs A, B & C are $\approx 20'$ Long

The walls were smeared to a height

 $\alpha \text{ BKG} = < 3 \text{ audible pops/min.}$

of 10' areas on P/oom of tunnel

which had Radioactivity was deconed

and smeared again until the activity

was $\approx$ Background levels. The sect-

cars were marked on the town floor

by green duct tape and a hotten designation

Suck

N/A

Samples Counted with portable instruments for 17 minutes.

ADDITIONAL REPORTS

RPR No. N/A

Sample Counter Log(s) N/A See Screen Log # T-06201995
Room 101 271-T

RSR No. N/A

... Contamination - Skin N/A Procedure: updx I 2.1

Contamination - Clothing

Other(s) WHC - 1P. 0718

HPT:

Payroll No.: 81834

First-Line HP Manager:

Date: 6/28/96

Payroll No.: 234887

Name (Print): Calvin Nelson

Name (Print): JR Ellis

Signature: Ped. R. R. R.

Signature: SK 6.66

BD-6000-010.1 (01/94)

Map/Sketch

N/A

N/A

N/A

N/A

Westinghouse Hanford Company - Radiological Control				RADIOLOGICAL SURVEY REPORT		Survey No. N^o 243854				
Date 06-21-90		Time 0815-1130		RWP No.(s) T-115		Page 1 of 2				
Area/Bldg./Room/Location (Code) 20000222KT Tunnel (087)						F.C. T				
Job Description: Survey section "G" in preparation for painting.				Purpose of Survey (check appropriate box(es)): Contamination Incident: ☐ Skin, ☐ Clothing, ☐ Spill Alarm Response: ☐ CAM, ☐ ARM(RAM), ☐ PSD ☐ HRA/VHRA Work ☒ Job Coverage ☐ Other ☐ Exposure Incident ☐ Material Release ☐ RM Transfer/Shipment ☐ Required, Task No.						
Roll - up door 										
No.	Description	Dist.	DOSE RATE			CONTAMINATION LEVELS				
			$\dot{S}$ (non-pen) mrad/h	$\dot{\gamma}$ (pen) mR/h	$\dot{q}$ mrem/h	Direct (dpm/probe)		Smear (/100cm ²)		
			$\dot{S}$	$\dot{\gamma}$	$\dot{q}$	$\dot{S}$	$\dot{\gamma}$	$\dot{q}$ (dpm)	$\dot{\alpha}$ (dpm)	mrad/h
1	Gross smear S. Upper wall	—						4,000	<6kg	—
2	Gross smear S. lower wall	—						4,000	<6kg	—
3	Gross smear N. Upper wall	—						4,000	<6kg	—
4	Gross smear N. lower wall	—						5,000	<6kg	—
5	Gross smear S Rail	—						30,000	<6kg	—
6	Gross smear N. Rail	—						7,000	<6kg	—
7	Gross smear S. Floor between rail & wall	—						10,000	<6kg	—
8	Gross smear inside rails	—						20,000	<6kg	—
9	Gross smear N. Floor between rail & wall	—						7,000	<6kg	—
Continued on page 2										
Air Sample Results (μ Ci/ml)						Legend				
	BZ	GA	Initial	Decay		(#) - Smear Location (Δ) - Air Sample Location [] - Large Area Smear * - Contact Reading				
a 1	↓		7.5 E-13	N/A		Other <u>N/A</u>				
B 1	↓		3.00 E-12	N/A						
a 2			N/A							
B 2										

WHC - Radiological Control RADIOLOGICAL SURVEY REPORT				F.C. <u>T</u>		Page <u>2</u> of <u>2</u>		Survey No. <u>N: 243854</u>		
No.	Description	Dist.	DOSE RATE			CONTAMINATION LEVELS				
			$\dot{H}$ (non-pen) mrad/h	$\dot{\gamma}$ (pen) mR/h	$\dot{H}$ mrem/h	Direct (dpm/probe)		Smear (/100cm ²)		
						β	α	β (dpm)	α (dpm)	mrad/h
10	Tech smear S Rail	---						1500	<100	---
11	Tech Smear N Rail	---						1000	<100	---
12	Gross smear ladder on SWall	---						5000	<100	---
13	Dose rate area	F	<0.5	<0.5	---					---
N/A										
Comments α bkg $\leq$ 3cpm. β bkg 2000 dpm - all smears counted were above background levels. <div style="text-align: center;">N/A</div>										
Samples Counted with portable instruments for <u>N/A</u> minutes.										
Instr./Probe Model	RO-3B (CP)	E-140/Pancake (GM/Probe)	Doam	cam B-408						
Serial No.	6451	1222/1055	2416	408					N/A	
Efficiency	100%	10%	14%	32%						
Correction Factor	1	10	7	---						
ADDITIONAL REPORTS										
RPR No.	N/A	Sample Counter Log(s)	T-0621996-101							
RSR No.	N/A	... Contamination - Skin	N/A							
... Contamination - Clothing		N/A	Other(s)	N/A						
HPT: Payroll No.: <u>6008</u>										
First-Line HP Manager: Date: <u>6/28/96</u> Payroll No.: <u>84987</u>										
Name (Print): <u>Theresa L. Poston</u>										
Signature: <u>Theresa L. Poston</u>										
Name (Print): <u>JR Ellis</u>										
Signature: <u>JR Ellis</u>										

Westinghouse Hanford Company - Radiological Control
RADIOLOGICAL SURVEY REPORT

Page 7 of 8 Summary No.

N^o 243861

Date 6-21-96 Time 1700/2100 RWP No.(s) T-115 Page 1 of 4

Area/Bldg./Room/Location (Code)

200 West T-Plant 221-T Tunnel

F.C.

T

Job Description

Smear survey of the last
4 sections in the tunnel
(See H, I, J, and K) And the
Stair well from the tunnel
flow to the canyon deck.

Purpose of Survey (check appropriate box(es)):

Contamination Incident: ☐ Skin, ☐ Clothing, ☐ Spill
Alarm Response: ☐ CAM, ☐ ARM(RAM), ☐ PSD
☐ HRA/VHRA Work ☒ Job Coverage ☐ Other
☐ Exposure Incident ☒ Material Release
☐ RM Transfer/Shipment ☐ Required, Task No.

Map/Sketch

No.	Description	Dist.	DOSE RATE			CONTAMINATION LEVELS				
			β (non-pen) mrad/h	γ (pen) mR/h	η mrem/h	Direct (dpm/probe)		Smear $\pm 100\text{cm}^2$ <u>Law</u>		
						β	α	β (dpm)	α (dpm)	mrad/h
1	<u>Smear (see map)</u>							5000	<Det	
2								6000	<Det	
3								6000	<Det	
4								15000	<Det	
5								5000	<Det	
6								6000	<Det	
7								1000	<Det	
8								10,000	<Det	
9								20,000	<Det	
10	<u>Smear see map</u>							3000	<Det	

Continued on page 2

Air Sample Results ($\mu\text{Ci}/\text{ml}$)

	BZ	GA	Initial	Decay
α 1				
β 1				
α 2				
β 2				

Legend

(#) - Smear Location Δ - Air Sample Loca'
[#] - Large Area Smear * - Contact Rear'

Other N/A

No
Sign

Signature: <u><i>R. Rick</i></u> Name (Print): <u>Rick, R. Rick</u> Payroll No.: <u>66657</u> Date: <u>6-24-96</u> First-Line HP Manager:		Signature: <u><i>D.C. Walker</i></u> Name (Print): <u>D.C. Walker</u> Payroll No.: <u>61021</u> Date: <u>6/24/96</u>	
Contamination - Clothing: <u>N/A</u> Contamination - Skin: <u>N/A</u> Other(s): <u>N/A</u>		RSR No.: <u>N/A</u> RPR No.: <u>N/A</u> Sample Counter Log(s): <u>T-0621996 En-101</u> Procedure: <u>2-1-1 - 07/B</u>	

Inst./Probe	Model	Serial No.	Efficiency	Correction Factor
RO-3B	(CP)	6451	100	1
E-140/Pancake	(GM/Probe)	1542/655	10	10
Pan		2416	14	7

ADDITIONAL REPORTS

Samples Counted with portable instruments for N/A minutes.

Smear's that are recovered are highest found in Area
Two are large Area Smears (RAW). Count = no A or B
Pops Above Background with a thin hole alpha
meter (Pan) with a Background of < 30 cpm. N/A

No.	Description	Dist.	Count (n-1)	Count (n)	Count (n+1)	Count (n+2)	Count (n+3)	Count (n+4)	Count (n+5)	Count (n+6)	Count (n+7)	Count (n+8)	Count (n+9)	Count (n+10)	Count (n+11)	Count (n+12)	Count (n+13)	Count (n+14)	Count (n+15)	Count (n+16)	Count (n+17)	Count (n+18)	Count (n+19)	Count (n+20)
11	Smear (see map)																							
12																								
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																								

DOSE RATE		CONTAMINATION LEVELS	
Direct (dpm/gobe)	Smear (1/100cm ²)	Direct (dpm/gobe)	Smear (1/100cm ²)
5,000	5,000	5,000	5,000
10,000	10,000	10,000	10,000
15,000	15,000	15,000	15,000
20,000	20,000	20,000	20,000
25,000	25,000	25,000	25,000
30,000	30,000	30,000	30,000
35,000	35,000	35,000	35,000
40,000	40,000	40,000	40,000
45,000	45,000	45,000	45,000
50,000	50,000	50,000	50,000

WHC - Radiological Control
 RADIOLOGICAL SURVEY REPORT
 F.C. T Page 2 of 4 Survey No. 243861

Westinghouse Hanford Company - Health Physics RADIOLOGICAL SURVEY REPORT Continuation Sheet				F.C. T	Survey No. 243861		Page 3 of 4			
No.	Description	Dist.	DOSE RATE			CONTAMINATION LEVELS				
			β (non-pen) mrad/h	γ (pen) mR/h	n mrem/h	Direct (dpm/probe)		Smear (/100cm ²)		
						β	α	β (dpm)	α (dpm)	mrad/h
21	Smear (see map)	—	—	—	—	—	—	9000	<det	—
22	Survey of 4 masks	—	—	—	—	25K ADW	<100	<1K	<20	—
23	Survey of Tools and	—	—	—	—	25K	<100	<1K	<20	—
—	Equipment	—	—	—	—	—	—	—	—	—
24	Dose rate of	F	<1.5	<1.5	—	—	—	—	—	—
—	Work Area	—	—	—	—	—	—	—	—	—
25	Smear of stair well	—	—	—	—	—	—	5000	<det Rel	—

Westinghouse Hanford Company - Health Physics
RADIOLOGICAL SURVEY REPORT Continuation Sheet

F.C.

T

Survey No.

243861

Page 4 of 4

Map/Sketch

N

~~1~~

A

Westinghouse Hanford Company - Radiological Control
RADIOLOGICAL SURVEY REPORT

N^o 243862

Date 06-24-96 Time 1245-1540 RWP No.(s) T-228 Page 1 of 2

Area/Bldg./Room/Location (Code)

200W/221-T Canyon - tunnel deck opening Section 2 (A)

F.C.

T

Job Description

Characterization survey of the
tunnel deck opening on the canyon deck

Purpose of Survey (check appropriate box(es)):

Contamination Incident: ☐ Skin, ☐ Clothing, ☐ Spill

Alarm Response: ☐ CAM, ☐ ARM(RAM), ☐ PSD

☐ HRA/VHRA Work ☒ Job Coverage ☐ Other

☐ Exposure Incident ☐ Material Release

☐ RM Transfer/Shipment ☐ Required, Task No.

Map/Sketch

No.	Description	Dist.	DOSE RATE			CONTAMINATION LEVELS				
			S (non-pen) mrad/h	Y (pen) mR/h	g mrem/h	Direct (dpm/probe)		Smear (/100cm ²)		
						B	α	S (dpm)	α (dpm)	mrad/h
1	Gross smear walkway	—	—	—	—	—	—	—	—	—
1	around opening	—	2.5	2.5	—	—	—	150000	4000	—
2	Gross smear 4"x18" strip	—	—	—	—	—	—	—	—	—
—	on North ledge	—	—	—	—	—	—	20000	4000	—
3	Gross smear 4"x18" strip	—	—	—	—	—	—	—	—	—
—	on south ledge	—	—	—	—	—	—	30000	4000	—
4	Smear 6"x12" section	—	—	—	—	—	—	—	—	—
—	under piping on north wall	—	—	—	—	—	—	300000	4000	—

Continued on page 2

Air Sample Results (μCi/ml)				Legend	
	BZ	GA	Initial	Decay	
# 1	✓		7.33 E-15	✓/A	# - Smear Location ▲ - Air Sample Location
# 1	✓		1.25 E-13		■ - Large Area Smear * - Contact Reading
# 2					
# 2			N/A		Other <u>N/A</u>

[illegible]

Westinghouse Hanford Company - Radiological Control
RADIOLOGICAL SURVEY REPORT

N^o 243867

Date 6-25-96 Time 2000-2330 RWP No. (s) T-228 Page 1 of 2

Area/Bldg./Room/Location (Code) Canyon 221-T Sec. #3 (#14) F.C. T

Job Description Decommed with H₂O₂ vacuum
Sec #3 Tunnel openings around
the edges

Purpose of Survey (check appropriate box(es)):
Contamination Incident: ☐ Skin, ☐ Clothing, ☐ Spill
Alarm Response: ☒ CAM, ☐ ARM(RAM), ☐ PSD
☐ HRA/VHRA Work ☒ Job Coverage ☐ Other
☐ Exposure Incident ☐ Material Release
☐ RM Transfer/Shipment ☐ Required, Task No.

Map/Sketch

No.	Description	Dist.	DOSE RATE			CONTAMINATION LEVELS				
			β (non-pen) mrad/h	γ (pen) mR/h	n mrem/h	Direct (dpm/probe)		Smear (/100cm ²)		
						β	α	β (dpm)	α (dpm)	mrad/h
1	General Area (working)	5 ft	2.5	2.5	N/A	N/A	N/A	N/A	N/A	N/A
2	① smear on edge of opening	N/A	N/A	N/A		N/A	N/A	2K	<D	—
3	② smear on edge of opening							2K	<D	—
4	③ smear on edge of opening							2K	<D	—
5	④ Smear on edge of opening							1.5K	<D	—
6	⑤ Smear on edge of opening							2K	<D	—
7	⑥ Smear on edge of opening							4K	<D	—

Continued on page 2

Air Sample Results (μCi/ml)					Legend
	BZ	GA	Initial	Decay	
#1		✓	4.48 E-13	N	# - Smear Location Δ - Air Sample Location # - Large Area Smear * - Contact Reading Other <u>N/A</u>
#1		✓	9.96 E-13	A	
#2			N	N	
#2			A	A	

Survey No. **N^o 243867**

[illegible]

LD = No Audible pops above background Sample # 0008
Smears were taken on the edge of the opening to the Tunnel.
X/1/1 X/1/1

Samples Counted with portable instruments for 144 minutes.

Instr./Probe Model	RO-3B (CP)	E-140/Pancake (GM/Probe)	Part					
Serial No.	6606	1942/567	291					
Efficiency	100%	10%	14%					
Correction Factor	1	10	7					

RPR No. N/A Sample Counter Log(s) T0626 1996 220 WHS 190718
 RSR No. N/A ... Contamination - Skin N/A Procedure: 2.1
 ... Contamination - Clothing N/A Other(s) N/A

Signature: *IR E. L. L.*

Westinghouse Hanford Company - Radiological Control
RADIOLOGICAL SURVEY REPORT

Survey No.
Nº 243892

Date **6-28-96** Time **0730/1200** RWP No.(s) **T-228**

Page **1** of **2**

Area/Bldg./Room/Location (Code)

200W/221-T/Canyon/section 2/14

F.C.

T

Job Description

**Opening between Tunnel
and Canyon was vacuumed and
surveyed.**

N/A

Purpose of Survey (check appropriate box(es)):

Contamination Incident: ☐ Skin, ☐ Clothing, ☐ Spill

Alarm Response: ☐ CAM, ☐ ARM(RAM), ☐ PSD

☐ HRA/VHRA Work ☒ Job Coverage ☐ Other

☐ Exposure Incident ☐ Material Release

☐ RM Transfer/Shipment ☐ Required, Task No.

Map/Sketch

← **Tunnel Rollup Door**

Canyon "R" doors →

No.	Description	Dist.	DOSE RATE			CONTAMINATION LEVELS				
			B (non-pen) mrad/h	γ (pen) mR/h	γ mrem/h	Direct (dpm/probe)	Gross Smear	100cm	25cm	25cm
1	Vacuum deck	Field	0.5	0.5	—	—	—	—	—	—
2	Back ledges	—	—	—	—	—	50K	<100	—	—
3	Left Top ledge	—	—	—	—	—	20K	<100	—	—
4	Left Bottom Ledge	—	—	—	—	—	30K	<100	—	—
5	Right Top Ledge	—	—	—	—	—	30K	<100	—	—
6	Right Bottom Ledge	—	—	—	—	—	450K	<100	2	—
7	Front Top Ledge	—	—	—	—	—	35K	<100	—	—
8	Front Bottom Ledge	—	—	—	—	—	20K	<100	—	—
N/A			N/A			N/A				

Continued on page 2

Air Sample Results (μCi/ml)

	BZ	GA	Initial	Decay
1	N/A	✓	6.6E-13	—
2	N/A	✓	1.12E-12	—
3	—	—	N/A	N/A
4	—	—	A	N/A

Legend

① - Smear Location ▲ - Air Sample Location

■ - Large Area Smear * - Contact Reading

Other **▨** - Ledge

Survey No. **243892**

Comments

Gross Contamination 5 mears approximately equal to 4 inches by 120 inches = 3000 cm^2 . Air sampler at section 2.

Samples Counted with portable instruments for 11 minutes.

ADDITIONAL REPORTS

RPR No. N/A Sample Counter Log(s) T-06281996-220
 RSR No. A ... Contamination - Skin N/A Procedure: 2.1 ~~WHC-IP-279~~
 ... Contamination - Clothing N/A Other(s) A

HPT: Payroll No.: 6C660

Name (Print): DR DABBS

Signature: D. K. Jabs

First-Line HP Manager:

Date: 7/2/96 Payroll No.: 84887

Name (Print): JR Ellis

Signature: AK Williams

Westinghouse
Hanford Company

Internal
Memo

From: T Plant Radiological Control
Phone: 376-5696 T3-20
Date: April 23, 1996
Subject: AIR FLOW PATTERNS IN THE 221-T TUNNEL

33541-96-RBS-002

To: L. T. Blackford T3-28
R. B. Swallow T3-20

cc: W. S. Ayers T3-28
E. J. Adams T4-06
T. L. Erickson T3-28
M. R. Fishburn T4-06
C. K. Girres T3-28
S. H. Norton T3-28
W. Smith T3-20
L. O. Waggoner T0-06
M. S. Wright T3-28
SWDPC SAT 3 T3-28
RBS File/LB

On Wednesday April 17, 1996, T Plant Radiological Control conducted an air flow pattern study to determine the direction of air movement within the tunnel and between the tunnel and canyon areas. These areas are currently airborne radioactivity areas. The purpose of the test was to verify directional flow from the tunnel to the canyon in support of an effort to remove the tunnel from airborne status. Smoke was generated at various locations within the tunnel: at approximately 100 feet from the canyon entrance at floor and head level, directly below the canyon entrance at floor and head level, and at the entrance to the canyon at the tunnel ceiling level.

The tunnel has no inherent ventilation system. The canyon ventilation system pulls air into the tunnel through openings around the manway and roll-up doors, and then into the canyon through the tunnel/canyon entry. The smoke released in the tunnel demonstrated the following characteristics:

At 100 feet from the canyon entrance, the smoke traveled towards the roll-up door at floor and head level. As the smoke rose, it hovered at approximately 10 feet, and then moved towards the canyon entrance at levels above approximately 15 feet. These height measurements are estimated.

Directly below the canyon entrance, the smoke expanded and hovered, drifting slowly upward. This upward movement was more defined when the manway door was open. At the maintenance platform level, the smoke filled the airspace, drifting upward.

At the entrance to the canyon at the tunnel ceiling level, the smoke moved directly out of the tunnel and into the canyon. The smoke moved approximately 10 feet in 10 seconds (1 ft/sec) with the tunnel doors closed. This velocity was estimated. With the manway door open, the

L. T. Blackford
R. B. Swallow
April 23, 1996
Page 2 of 2

33541-96-RBS-002

smoke rose at a faster rate, approximately 10 feet in 7 to 8 seconds (~1.3 to 1.4 ft/sec). Once the smoke was inside the canyon, it expanded and directional flow was not discernable. After the smoke release was completed (approximately 30 minutes) a build-up of smoke could be seen over sections three and four in the north end of the canyon.

The attached drawing shows the air flow patterns observed in the tunnel.

The air flow pattern test indicates that the tunnel has the necessary directional air flow to prevent suspended contamination in the canyon air from entering the tunnel while the tunnel doors are closed and while the manway door is open. This test could be further strengthened by quantitative measurements of air flow during normal working conditions. Administrative controls (procedures, Radiation Work Permits, etc.) as well as engineering controls (decontamination of canyon deck area near tunnel entry, etc.) should be incorporated and the area downposted before the tunnel is removed from airborne status.

J. R. Ellis, Advanced Health Physicist
T Plant Radiological Control

jre

Attachment

T PLANT

SYSTEM

ALARM RESPONSE PROCEDURE

221-T ALARMS

RESPOND TO OPERATING GALLERY, SECTION 18 ALARMS

OPERATING GALLERY, SECTION 18 ANNUNCIATOR PANEL INDEX

ALARM NO.	DESCRIPTION	PAGE
1	Remote High level Alarm for Sump 5-8	2
2	Remote High/High Alarm for Tank 5-7	3
3	Remote High Level Alarm for Tank 5-7	4
4-8	Spare	5
9	Spare	10
10	Trouble Alarm for 2706-T	11
11-14	Spare	12
15	High Differential Pressure Alarm for the Canyon	13
16	Spare	17
17	EVAC 2101-RMT.	18
FIGURE 1	SECTION 18, ANNUNCIATOR PANEL, OPERATING GALLERY	19
FIGURE 2	EVAC 2101-RMT, CANYON EVACUATION ALARM, ROOM 218	20

T PLANT ALARM RESPONSE PROCEDURE

Attachment 6
Page 1 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

WHITE

**SUMP 5-8
HIGH**

ALARM #: 1
ALARM CLASS: 2
SETPOINT: 10 in.

-
- OPERATOR ACTIONS**
1. **ACKNOWLEDGE** the alarm.
 2. **NOTIFY** Duty Operations Manager and EET of the alarm condition and levels in Tank 5-7 and Sump 5-8.
 3. **CEASE** all liquid accumulation into Tank 5-7.
 - a. **STOP** all liquid waste transfers (ie.-from 2706-T, to railcars, etc..).
 - b. **CLOSE** canyon water supply valves W-PW-0-20-202 and W-PW-20-262.
 4. **INVESTIGATE** possible causes of the alarm.
-

- POSSIBLE CAUSES**
1. Rising liquid in sump as a result of Tank 5-7 leakage or overflow.
 2. Liquid spilling into the sump from the canyon deck.
 3. Instrument malfunction.

OTHER INDICATIONS: 2 Small Flashing Red Lights next to Annunciator Window
Audible Alarm on Annunciator Panel
Local Annunciator #1 in Section 5 of the Operating Gallery.

ALARM DESCRIPTION: The sump collects overflow liquid from Tank 5-7. If more than 10 in. of liquid is detected in the sump, an audible alarm and two small flashing red lights are activated at the Section 18 annunciator panel. A local alarm # 1 should also be activated in Section 5 of the Operating Gallery.

REFERENCES WHC-SD-CP-SAR-007, T Plant Safety Analysis Report (SAR)
H-2-904

T PLANT ALARM RESPONSE PROCEDURE

Attachment A
Page 1 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

WHITE

TANK 5-7 NEAR OVERFLOW

ALARM #: 2
ALARM CLASS: 3
SETPOINT: 90% of Capacity

- OPERATOR ACTIONS**
1. **ACKNOWLEDGE** the alarm.
 2. **NOTIFY** Duty Operations Manager and EET of the alarm condition and levels in Tank 5-7 and Sump 5-8.
 3. **CEASE** all liquid accumulation into Tank 5-7.
 - a. **STOP** all liquid waste transfers (ie.-from 2706-T, to railcars, etc..).
 - b. **CLOSE** canyon water supply valves W-PW-0-20-202 and W-PW-20-262.
 4. **INVESTIGATE** possible causes of the alarm.

- POSSIBLE CAUSES**
1. High liquid level in Tank 5-7.
 2. Instrument malfunction.

OTHER INDICATIONS: 2 Small Flashing Red Lights next to Annunciator Window
Audible Alarm on Annunciator Panel
Local Annunciator # 2 in Section 5 of the Operating Gallery.

ALARM DESCRIPTION: Wastes from individual canyon cells drain into a common drain header that terminates at Tank 5-7 in the deep cell 5-R. Liquid waste from Building 2706-T is discharged into cell 6-L, from which it also drains into Tank 5-7. When Tank 5-7 reaches a liquid level above 90%, an audible alarm and two small flashing red lights are activated at the annunciator panel. A local alarm (see alarm # 29) should also be activated in Section 5 of the Operating Gallery.

REFERENCES WHC-SD-CP-SAR-007, T Plant Safety Analysis Report (SAR)
H-2-88613

Attachment 4
Page 1 of 22

T PLANT ALARM RESPONSE PROCEDURE

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

WHITE

TANK 5-7 OVER NORMAL LIMIT

ALARM #: 3
ALARM CLASS: 4
SETPOINT: 70% of capacity

-
- OPERATOR ACTIONS**
1. **ACKNOWLEDGE** the alarm.
 2. **NOTIFY** Duty Operations Manager of the alarm condition and level of Tank 5-7.
 3. **CEASE** all liquid generating activities in the canyon and tunnel.
 4. **CEASE** all transfers from 2706-T, and/or railcar transfers to Tank 5-7.
 5. **INSPECT** the Canyon using the video cameras.
 6. **IF** level continues to increase after 10 minutes: **TRANSFER** tank contents as directed by Operations Management.
-

- POSSIBLE CAUSES**
1. High liquid level in Tank 5-7.
 2. Instrument malfunction.
 3. Pipe leaking in Canyon.

OTHER INDICATIONS: 2 Small Flashing Red Lights next to Annunciator Window.
Local Alarm # 3 in Section 5 of the Operating Gallery.
Audible Alarm on Annunciator Panel

ALARM DESCRIPTION: Wastes from individual canyon cells drain into a common drain header that terminates at Tank 5-7 in the deep cell 5-R. Liquid waste from Building 2706-T is discharged into cell 6-L, from which it also drains into Tank 5-7. When Tank 5-7 reaches a liquid level above 70%, an audible alarm and two small flashing red lights are activated at the annunciator panel. A local alarm # 3 should also be activated in Section 5 of the Operating Gallery.

REFERENCES WHC-SD-CP-SAR-007, T Plant Safety Analysis Report (SAR)

T PLANT ALARM RESPONSE PROCEDURE

Attachment 1
Page 7 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

SPARE

ALARM #: 4
ALARM CLASS:
SETPOINT:

OPERATOR ACTIONS

POSSIBLE CAUSES

OTHER INDICATIONS:

ALARM DESCRIPTION:

REFERENCES:

T PLANT ALARM RESPONSE PROCEDURE

Attachment 4
Page 3 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

SPARE

ALARM #: 5
ALARM CLASS:
SETPOINT:

OPERATOR ACTIONS

POSSIBLE CAUSES

OTHER INDICATIONS:

ALARM DESCRIPTION:

REFERENCES:

T PLANT ALARM RESPONSE PROCEDURE

Attachment 4
Page 1 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

SPARE

ALARM #: 6
ALARM CLASS:
SETPOINT:

OPERATOR ACTIONS

POSSIBLE CAUSES

OTHER INDICATIONS:

ALARM DESCRIPTION:

REFERENCES:

Document No.

ARP-D-463-00003

Rev/Mod

A-0

Page

7 of 20

T PLANT ALARM RESPONSE PROCEDURE

Attachment 4

Page 10 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

SPARE

ALARM #: 7
ALARM CLASS:
SETPOINT:

OPERATOR ACTIONS

POSSIBLE CAUSES

OTHER INDICATIONS:

ALARM DESCRIPTION:

REFERENCES:

T PLANT ALARM RESPONSE PROCEDURE

Attachment 4
Page 11 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

SPARE

ALARM #: 8
ALARM CLASS:
SETPOINT:

OPERATOR ACTIONS

POSSIBLE CAUSES

OTHER INDICATIONS:

ALARM DESCRIPTION:

REFERENCES:

T PLANT ALARM RESPONSE PROCEDURE

Attachment 4
Page 12 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

WHITE

Spare

ALARM #: 9
ALARM CLASS:
SETPOINT:

OPERATOR ACTIONS

POSSIBLE CAUSES

OTHER INDICATIONS

ALARM DESCRIPTION

REFERENCES

Document No.

ARP-D-463-00003

Rev/Mod

A-0

Page

10 of 20

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

WHITE

**2706 T
TROUBLE**

ALARM #: 10
ALARM CLASS: 4
SETPOINT: N/A

-
- OPERATOR ACTIONS**
1. **ACKNOWLEDGE** the alarm.
 2. **NOTIFY** Duty Operations Manager of the alarm condition.
 3. **DETERMINE** which of the possible causes has initiated and take appropriate alarm response actions (see ARP-D-463-00001).
-

- POSSIBLE CAUSES**
1. 2706-T master alarm switched off for ACT-1.
 2. Any alarm associated with the 2706-T alarm panel is activated.
 3. Normal shutdown of the 2706-T ventilation system.
 4. Instrument malfunction.
 5. Power failure at 2706-T.

OTHER INDICATIONS: 2 Small Flashing Red Lights next to Annunciator Window
Audible Alarm on Annunciator Panel

ALARM DESCRIPTION: The Trouble Alarm is activated when any alarm at the 2706-T building is actuated (see ARP-D-463-00001, 2706-T Alarm Response Procedure for descriptions). Such an occurrence is indicated by two small flashing red lights next to the white annunciator window and an audible alarm on the annunciator panel. This alarm will also be activated when the 2706 ACT-1 ventilation system master alarm switch is shut off.

REFERENCES H-2-83100, H-2-83103

T PLANT ALARM RESPONSE PROCEDURE

Attachment 4
Page 14 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

SPARE

ALARM #: 11
ALARM CLASS:
SETPOINT:

OPERATOR ACTIONS

POSSIBLE CAUSES

OTHER INDICATIONS:

ALARM DESCRIPTION:

REFERENCES:

T PLANT ALARM RESPONSE PROCEDURE

Attachment 4
Page 15 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

SPARE

ALARM #: 12

ALARM CLASS:

SETPOINT:

OPERATOR ACTIONS

POSSIBLE CAUSES

OTHER INDICATIONS:

ALARM DESCRIPTION:

REFERENCES:

T PLANT ALARM RESPONSE PROCEDURE

Attachment 4
Page 16 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

SPARE

ALARM #: 13
ALARM CLASS:
SETPOINT:

OPERATOR ACTIONS

POSSIBLE CAUSES

OTHER INDICATIONS:

ALARM DESCRIPTION:

REFERENCES:

T PLANT ALARM RESPONSE PROCEDURE

Attachment 4
Page 17 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

SPARE

ALARM #: 14
ALARM CLASS:
SETPOINT:

OPERATOR ACTIONS

POSSIBLE CAUSES

OTHER INDICATIONS:

ALARM DESCRIPTION:

REFERENCES:

Document No.

ARP-D-463-00003

Rev/Mod

A-0

Page

15 of 20

Attachment 4
18 of 22

T PLANT ALARM RESPONSE PROCEDURE

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

WHITE

**CANYON
HIGH DP**

ALARM #: 15
ALARM CLASS: 3
SETPOINT: - 0.70 in. w.g.

-
- OPERATOR ACTIONS**
1. **ACKNOWLEDGE** the alarm.
 2. **NOTIFY** Duty Operations Manager of the alarm condition (Duty Ops. Manager will determine corrective actions).
 3. **IF** the alarm does NOT clear within 5 minutes:
 - a. **EVACUATE** personnel in the Canyon and Crane Cab.
 - b. **ILLUMINATE** Canyon DO NOT ENTER sign using switch in Rm. 218.
 - c. **CHECK** for abnormal differential pressures of the operating exhaust filter banks.
-

NOTE: Maximum DP allowed by the SAR is 1.00 in. w.g.

- POSSIBLE CAUSES**
1. Filter failure.
 2. Supply fan malfunction.
 3. Instrument malfunction.

OTHER INDICATIONS: 2 Small Flashing Red Lights next to Annunciator Window
Audible Alarm on Annunciator Panel

ALARM DESCRIPTION: Failure to maintain a proper differential pressure (DP) could endanger the Plant structure and stability (especially the canyon doors). When DP exceeds 0.70 in. w.g., an audible alarm sounds and two small red lights flash next to the window at the annunciator panel

REFERENCES WHC-SD-CP-SAR-007, T Plant Safety Analysis Report (SAR)

T PLANT ALARM RESPONSE PROCEDURE

Attachment 4
Page 19 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 1

SPARE

ALARM #: 16
ALARM CLASS:
SETPOINT:

OPERATOR ACTIONS

POSSIBLE CAUSES

OTHER INDICATIONS:

ALARM DESCRIPTION:

REFERENCES:

T PLANT ALARM RESPONSE PROCEDURE

Attachment 4
Page 20 of 22

FACILITY: 221-T

PANEL LOCATION: Section 18 of the Operating Gallery. See Figure 2

ALARM #: 17 (EVAC 2101-RMT)

ALARM CLASS: 2

SETPPOINT: - 0.06 in. w.g.

- OPERATOR ACTIONS**
1. **NOTIFY** Duty Operations Manager of the alarm condition (Duty Ops. Manager will determine corrective actions).
 2. **STOP** decontamination activities.
 3. **IF** the cause of the canyon low DP alarm is due to opening the tunnel roll-up door, operations will be limited in order to control the spread of contamination.
 4. **IF** the cause of the low DP alarm is NOT due to the opening of the roll-up door, and the DP cannot be restored within 5 minutes:
 - a. **EVACUATE** personnel in the canyon, tunnel and crane cab.
 - b. **ILLUMINATE** canyon "DO NOT ENTER" sign using the switch in Room 218.

NOTE - The following is an LCO as required by the SAR.

NOTE: The SAR does not allow decontamination work in the canyon if the DP is below 0.025 in. w.g. Also, the SAR states that the minimum allowable alarm set point is 0.030 in. w.g.

- POSSIBLE CAUSES**
1. Gusty winds, causing a temporary fluctuation in Canyon pressure.
 2. Tunnel door open.
 3. Supply fan malfunction.
 4. Loss of exhaust fan.
 5. Instrument malfunction.

- OTHER INDICATIONS:**
- Audible alarm in Room 218.
 - If alarm is silenced, "TROUBLE" LED will illuminate.
 - Horn and strobe in canyon and tunnel.

ALARM DESCRIPTION: Failure to maintain an adequate differential pressure (DP) between the canyon and the Operating Gallery could result in the release of radionuclides from the T Plant Canyon. The negative pressure in the canyon with respect to the Operating Gallery is required to prevent airborne contamination from moving to the occupied areas of the building or to the environment. When DP decreases to -0.06 in. w.g. or less, an audible alarm sounds and strobes flash in the canyon and tunnel. Duty Operations Supervisor can silence alarm tone (slow whoop) by activating the tone silence switch. (See Figure 2) The white strobe light will continue to flash until the DP returns to normal.

REFERENCES WHC-SD-CP-SAR-007, T Plant Safety Analysis Report (SAR); OSD-D-187-00008, Section 1.8.1

Document No.	Rev/Mod	Page
ARP-D-463-00003	A-0	18 of 20

T PLANT ALARM RESPONSE PROCEDURE

Attachment 4
21 of 22

SUMP 5-8 HIGH	☐	PWR ON	☐	SPARE
TANK 5-7 NEAR OVERFLOW	☐		☐	2706-T TROUBLE
TANK 5-7 OVER NORMAL LIMIT	☐		☐	SPARE
SPARE	☐		☐	SPARE
SPARE	☐		☐	SPARE
SPARE	☐		☐	SPARE
SPARE	☐		☐	SPARE
SPARE	☐		☐	CANYON HIGH DP
SPARE	☐		☐	SPARE
SPARE	☐		☐	

☐ TEST ☐ SIL ☐ ACK ☐ RESET

SECTION 18 ANNUNCIATOR PANEL
OPERATING GALLERY

FIGURE 1 - SECTION 18, ANNUNCIATOR PANEL, OPERATING GALLERY