AR TARGET SHEET

The following document was too large to scan as one unit; therefore, it has been broken down into sections.

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3/6

BNFL Inc.

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RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT

RPP-WTP DANGEROUS WASTE PERMIT APPLICATION

Volume III

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Prepared for:

U.S. Department of Energy
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Prepared By:

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Appendix 4G

Appendix 4G
Business Sensitive and Confidential
Detailed Engineering Descriptions

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Appendix 6A

Appendix 6A
Inspection Schedules

Appendix 6A
Inspection Schedules

This section provides an example schedule of inspections, including their frequencies, to be performed at the RPP-WTP. These example inspection schedules describe the process for inspection of monitoring equipment, safety and emergency equipment, security devices, preparedness and prevention equipment, and operating and structural equipment, that help prevent, detect, or respond to environmental or human health hazards related to mixed and dangerous waste. A copy of the inspection schedules will be retained at the RPP-WTP or other approved locations.

Table 6A-1 contains examples of the general inspection requirements. The remaining tables are organized first by type of waste management unit, and then by treatment system, number. For example, Table 6A-3 contains examples of inspection schedules for tank systems, beginning with those in the pretreatment plant; the applicable pretreatment systems are listed in ascending numeric order. Following is a list of tables and their locations included in this Appendix.

Table 6A-1. Example RPP-WTP General Inspection Schedule

Component Name	Inspection	Frequency
Security Devices		
RPP-WTP area fence	Check for damaged fencing	Weekly
Posted warning signs (see section 6.1.1.3)	Verify signs are present, legible, and visible	Monthly
Points of access to active portions(turnstiles), doors, and magnetic encoded bar readers	Verify operability	Monthly
Emergency Preparedness Equipment (see the *RPP-WTP Emergency Management Plan*)		
Safety showers and eyewash stations	Verify operability and sufficient pressure	Weekly
Automatic fire suppression system(s) (including fire alarm pull boxes)	Verify operability	Annually
Portable fire extinguishers (all types)	Check for adequate charge	Monthly
Emergency lighting	Test operability	Monthly
Spill kit and containment supplies	Verify contents complete	Quarterly
Emergency sirens and alarms	Verify operability	Monthly
Voice paging system	Verify operability	Monthly
Portable two-way radios	Verify operability and battery charge	Monthly
Pagers assigned to key personnel*	Verify operability	Weekly
Crash alarm telephone system	Verify operability	Monthly
Emergency telephones	Verify operability	Monthly
Priority message system (Management Bulletin)	Verify operability	Monthly
Self-contained breathing apparatus (SCBA)	Verify shelf life of SCBA is current and unit ready for use	Monthly
Respirators	Verify correct filter canisters available, canister packaging intact, current shelf life, and respirators ready for use	Quarterly
Personal protective clothing and equipment	Ensure supplies meet Contingency Plan requirements	Quarterly
Power Supply Inspections		
Emergency uninterruptible power supply system(s)	Verify operability	Monthly
Backup diesel generator	Verify operability and sufficient fuel source	Monthly

*To be defined

Table 6A-2. Example Container and Container Storage Area Inspection Schedules

Component Name	Component ID	Inspection	Frequency
HLW Vitrification Plant Container Storage Areas			
Melter Storage Areas No.1 and No. 2	NA	Verify major risk labels present and legible, ensure all containers closed (except when waste is being added to container); Check that container storage areas are free of liquid and debris; Check for significant cracks, gaps, and other signs of deterioration of storage area floors; Verify minimum 30 inches of aisle space between containers rows; Ensure that any containers holding free liquids have portable secondary containment and no liquids accumulated in portable secondary containment	Weekly
HLW container storage areas No.1 and No. 2	NA	Verify major risk labels present and legible, ensure all containers closed (except when waste is being added to container); Check that container storage areas are free of liquid and debris; Check for significant cracks, gaps, and other signs of deterioration of storage area floors; Verify minimum 30 inches of aisle space between containers rows; Ensure that any containers holding free liquids have portable secondary containment and no liquids accumulated in portable secondary containment	Weekly
Empty Immobilized HLW containers (canisters)	NA	Inspect container for liquid or debris inside, cracks, dents, bulges, gouges, or other abnormalities	Prior to filling
Filled IHLW containers (canisters)	NA	Inspect (by camera surveillance or cell window) each container for cracks, leaks, bulges, or other abnormalities	After sealing container
	NA	Record in tracking system each container's location when placed in storage; Record in tracking system all container location changes if container(s) are moved while in storage; Verify container in recorded location when transporting container out of RPP-WTP storage	Within 48 hours of placing or moving each container
IHLW container storage area	NA	Visually check (camera surveillance or other remote means) for damaged containers; Check for liquids, foreign materials, or debris in storage area; Check for cracks and deformities in storage area	Weekly when facility is storing waste in IHLW container storage area

Table 6A-2. Example Container and Container Storage Area Inspection Schedules

Component Name	Component ID	Inspection	Frequency
LAW Vitrification Plant Container Storage Areas			
LAW container storage area	NA	Verify major risk labels present and legible, ensure all containers closed (except when waste is being added to container); Check that container storage areas are free of liquid and debris; Check for significant cracks, gaps, and other signs of deterioration of storage area floors; Verify minimum 30 inches of aisle space between containers rows; Ensure that any containers holding free liquids have portable secondary containment and no liquids accumulated in portable secondary containment	Weekly
Empty ILAW Containers	NA	Visually inspect container for liquid or debris inside, cracks, dents, bulges, gouges, and irregular shape	Prior to filling
Filled ILAW containers	NA	Inspect (by camera surveillance or cell window) container for cracks, leaks, bulges, or other abnormalities Record in tracking system each container's location when placed in storage; Record in tracking system all container location changes if container(s) are moved while in storage; Verify container in recorded location when transporting container out of RPP-WTP storage	After container is sealed
ILAW buffer container storage area	NA	Visually check (camera surveillance or other remote means) for damaged containers; Check for liquids, foreign materials or debris in storage area; Check for cracks and deformities in storage area	Weekly when facility is storing waste
ILAW container storage area	NA	Visually check (camera surveillance or other remote means) for damaged containers; Check for liquids, foreign materials, or debris in storage area; Check for cracks and deformities in storage area	Weekly when facility is storing waste in IHLW container storage area
Pretreatment Plant Container Storage Area			
Pretreatment container storage areas No.1 and No.2	NA	Verify major risk labels present and legible; ensure all containers closed (except when waste is being added to container); Verify minimum 30 inches of aisle space between containers rows; Check that container storage areas are free of liquid and debris; Check for significant cracks, gaps, and other signs of deterioration of storage area floors	Weekly

Table 6A-2. Example Container and Container Storage Area Inspection Schedules

Component Name	Component ID	Inspection	Frequency
Miscellaneous dangerous waste storage area	NA	Verify major risk labels, ensure all containers closed (except when waste is being added to container); Check that container storage areas are free of liquid and debris; Verify minimum 30 inches of aisle space between containers rows; Check for significant cracks, gaps, and other signs of deterioration of storage area floors; Ensure that any containers holding free liquids have portable secondary containment and no liquids accumulated in portable secondary containment	Weekly
LAW Pretreatment Plant (LPP) Container Storage Area			
LAW pretreatment container storage area	NA	Verify major risk labels present and legible, ensure all containers closed (except when waste is being added to container); Check that container storage areas are free of liquid and debris; Verify minimum 30 inches of aisle space between containers rows; Check for significant cracks, gaps, and other signs of deterioration of storage area floors; Ensure that any containers holding free liquids have portable secondary containment and no liquids accumulated in portable secondary containment	Weekly
Central Waste Building			
Central waste container storage area	NA	Verify major risk labels present and legible, ensure all containers closed (except when waste is being added to container); Check that container storage areas are free of liquid and debris; Verify minimum 30 inches of aisle space between containers rows; Check for significant cracks, gaps, and other signs of deterioration of storage area floors; Ensure that any containers holding free liquids have portable secondary containment and no liquids accumulated in portable secondary containment	Weekly

Table 6A-3. Example Tank Systems Inspection Schedule

Component Name	Component ID	Inspection	Frequency
PT System 110: LAW Feed Receipt			
LAW feed receipt vessel V11020A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW feed receipt vessel V11020B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW feed receipt vessel V11020C level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW feed receipt vessel V11020D level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW feed receipt vessel V11020E level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW feed receipt vessel V11020F level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Vessel level measurement instrument			
PT System 120: LAW Feed Evaporation			
LAW feed evaporator feed vessel V11001A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW feed evaporator feed vessel V11001B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW evaporator circulation vessel V11002 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW feed evaporator process condensate pot V11005 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
PT System 210: HLW Feed Receipt			
Envelope D receipt vessel V12001A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Envelope D receipt vessel V12001B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Envelope D receipt vessel V12001C level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Envelope D receipt vessel V12001D level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Envelope D receipt vessel V12001E level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Envelope D receipt vessel V12001F	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
HLW acidic effluent hold vessel V12002	Unknown	Inspect tank level monitoring data to prevent overflow	Daily

Table 6A-3. Example Tank Systems Inspection Schedule

Component Name	Component ID	Inspection	Frequency
PT System 220: HLW Feed Pretreatment			
HLW ultrafiltration feed vessel V12004A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
HLW ultrafiltration feed vessel V12004B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
HLW feed blending vessel V12007 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
HLW ultrafiltration vessel V12006A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
HLW ultrafiltration vessel V12006B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
HLW ultrafiltration vessel V12006C level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
PT System 230: Entrained Solids, Strontium, and Transuranics Removal			
Evaporator concentrate buffer vessel V12010A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Evaporator concentrate buffer vessel V12010B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Ultrafiltration feed vessel V12011A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Ultrafiltration feed vessel V12011B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW Permeate hold vessel V12015A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW Permeate hold vessel V12015B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Entrained solids hold vessel V12016A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Entrained solids hold vessel V12016B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
PT System 310: Cesium Removal by Ion Exchange			
LAW feed tank V13001 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Cesium ion exchange column C13001	Unknown	Monitor column to prevent release	Daily
Cesium ion exchange column C13002	Unknown	Monitor column to prevent release	Daily
Cesium ion exchange column C13003	Unknown	Monitor column to prevent release	Daily
Cesium ion exchange column C13004	Unknown	Monitor column to prevent release	Daily

Table 6A-3. Example Tank Systems Inspection Schedule

Component Name	Component ID	Inspection	Frequency
Cesium ion exchange column C13011	Unknown	Monitor column to prevent release	Daily
Treated law collection tank V13004 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Caustic rinse tank V13007 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Caustic rinse collection tank vessel V13008 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
PT System 320: Nitric Acid Recovery			
Cesium eluate receipt vessel V13024A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Cesium eluate receipt vessel V13024B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Evaporator kettle V13026 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Recovered acid tank V13028 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Cesium eluate vessel V13027A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Cesium eluate vessel V13027B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Condensate pot V13029 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Cesium/technetium concentrate storage tank V13073 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
PT System 430: Decontamination			
Decontamination Vessel V14001	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Pump Bowl V14003	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
PT System 550: Plant Wash, Drain and Recycle			
Acidic effluent vessel V15013 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Plant wash vessel V15009 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Contaminant effluent vessel V15018 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LP System 130: LAW Melter Feed Evaporator			
LAW evaporator vessel V41011 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily

Table 6A-3. Example Tank Systems Inspection Schedule

Component Name	Component ID	Inspection	Frequency
Process condensate hold vessel V41013 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LP System 140: LAW Melter Feed Lag Storage System			
LAW Buffer Vessel A V41001A	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW Buffer Vessel B V41001B	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LP System 330: Technetium Removal by Ion Exchange			
Technetium ion exchange V43001A	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Technetium ion exchange buffer vessel V43001B	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Caustic rinse collection tank V43056	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Technetium ion exchange column C43006 level	Unknown	Inspect column level monitoring data to prevent overflow	Daily
Technetium ion exchange column C43007 level	Unknown	Inspect column level monitoring data to prevent overflow	Daily
Technetium ion exchange column C43008 level	Unknown	Inspect column level monitoring data to prevent overflow	Daily
Technetium ion exchange column C43009 level	Unknown	Inspect column level monitoring data to prevent overflow	Daily
Treated LAW buffer vessel V43110A	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Treated LAW buffer vessel V43110B	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Treated LAW buffer vessel V43110C	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LP System 340: Technetium Nitric Acid Recovery			
Technetium eluant receipt vessel V43067A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Technetium eluant receipt vessel V43067B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Recovery acid tank V43071 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Technetium eluant vessel V43070A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Technetium eluant vessel V43070B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily

Table 6A-3. Example Tank Systems Inspection Schedule

Component Name	Component ID	Inspection	Frequency
LP System 370: Spent Resin Recovery			
Resin flush collection vessel V43136 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Spent resin collection vessel V43135A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Spent resin collection vessel V43135B		Inspect tank level monitoring data to prevent overflow	Daily
LP System 510: Pretreatment Radioactive Liquid Effluent Management			
Process condensate vessel V45028A level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Process condensate vessel V45028B level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Process condensate vessel V45028C level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LP System 550: Plant Wash, Drain and Recycle			
Plant wash vessel V45009	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Alkaline effluent vessel V45013	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Alkaline effluent vessel V45018	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LV System 110: LAW Melter Feed System			
LAW concentrate receipt vessel V21001 high-level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW concentrate receipt vessel V21001 high-high level automatic waste feed cutoff	Unknown	Perform function test	Annually
LAW concentrate receipt vessel V21002 high level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW concentrate receipt vessel V21002 high-high level automatic waste feed cutoff	Unknown	Perform function test	Annually
LAW concentrate receipt vessel V21003 high level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW concentrate receipt vessel V21003 high-high level automatic waste feed cutoff	Unknown	Perform function test	Annually
LAW melter 1 feed preparation vessel V21101 high-level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW melter 1 feed preparation vessel V21101 high-high level automatic waste feed cutoff	Unknown	Perform function test	Annually

Table 6A-3. Example Tank Systems Inspection Schedule

Component Name	Component ID	Inspection	Frequency
LAW melter 2 feed preparation vessel V21201 high-level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW melter 2 feed preparation vessel V21201 high-high level automatic waste feed cutoff	Unknown	Perform function test	Annually
LAW melter 3 feed preparation vessel V21301 high level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW melter 3 feed preparation vessel V21301 high-high level automatic waste feed cutoff	Unknown	Perform function test	Annually
LAW melter 1 feed vessel V21102 high level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW melter 1 feed vessel V21102 high-high level automatic waste feed cutoff	Unknown	Perform function test	Annually
LAW melter 2 feed vessel V21202 high level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW melter 2 feed vessel V21202 high-high level automatic waste feed cutoff	Unknown	Perform function test	Annually
LAW melter 3 feed vessel V21302 high-level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW melter 3 feed vessel V21302 high-high level automatic waste feed cutoff	Unknown	Perform function test	Annually
LV System 231, 232, 233 and 234: LAW Melter Offgas System			
Caustic collection vessel V22001 high level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
SBS condensate vessel 1 V22101 high level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
SBS condensate vessel 2 V22201 high level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
SBS condensate vessel 3 V22301 liquid level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LV System 510			
SBS condensate collection vessel V25003 high level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
LAW plant wash vessel V25001 high level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
C3/C5 Drain/Sump collection vessel V25002 high level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily

Table 6A-3. Example Tank Systems Inspection Schedule

Component Name	Component ID	Inspection	Frequency
HV System 110: Waste Receipt			
HLW feed concentrate vessel V31001 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
HLW feed concentrate receipt vessel V31002 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
HV System 131: HLW Melter Feed Preparation and Melter Feed System			
HLW feed preparation vessel V31101, level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
HLW feed vessel V31102, level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
HV System 231: HLW Vitrification Offgas Treatment System			
SBS condensate vessel V32101 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
HV System 330: Canister Decon Cave			
Canister decontamination vessel V33001 liquid high level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Waste neutralization vessel V33002	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
HV System 510: HLW Radioactive Liquid Effluent System			
Low active effluent vessel 35001	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Acidic waste vessel V35002 liquid high-level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
HLW plant wash vessel V35003 liquid high-level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily
Acidic waste V35002 high-high liquid level automatic feed cutoff device	Unknown	Perform function test	Annually
Plant wash vessel V35003 high-high liquid level automatic feed cutoff device	Unknown	Perform function test	Annually
Decon effluent collection vessel V35009 level	Unknown	Inspect tank level monitoring data to prevent overflow	Daily

Table 6A-4. Example Secondary Containment Inspection Schedule

Component Name	Component ID	Inspection	Frequency
Pretreatment Plant: Cell No. 001			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
Pretreatment Plant: Cell No. 002			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
Pretreatment Plant: Cell No. 003			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
Pretreatment Plant: Cell No. 004			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
Pretreatment Plant: Cell No. 005			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
Pretreatment Plant: Cell No. 006			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years

Table 6A-4. Example Secondary Containment Inspection Schedule

Component Name	Component ID	Inspection	Frequency
Pretreatment Plant: Cell No. 007			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
Pretreatment Plant: Cell No. 008			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
Pretreatment Plant: Cell No. 009			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
Pretreatment Plant: Cell No. 010			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
Pretreatment Plant: Cell No. 011C			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
Pretreatment Plant: Cell No. 011U			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years

Table 6A-4. Example Secondary Containment Inspection Schedule

Component Name	Component ID	Inspection	Frequency
Pretreatment Plant: Cell No. 012			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
Pretreatment Plant: Process Bulge Area			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 ears
Pretreatment Plant: Maintenance Cave			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
LAW Pretreatment Plant: TcIX			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
LAW Pretreatment Plant: Pump Bulges			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
LAW Pretreatment Plant: LAW Melter Feed/Evaporator			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years

Table 6A-4. Example Secondary Containment Inspection Schedule

Component Name	Component ID	Inspection	Frequency
LAW Pretreatment Plant: Feed Receipt			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
LAW Vitrification: L-186			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
LAW Vitrification: L-187			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
LAW Vitrification: L-188			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
LAW Vitrification: L-189			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
LAW Vitrification: L-007			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years

Table 6A-4. Example Secondary Containment Inspection Schedule

Component Name	Component ID	Inspection	Frequency
LAW Vitrification: L-333			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
HLW Vitrification: H-027			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 ears
HLW Vitrification: H-153			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
HLW Vitrification: H-035			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
HLW Vitrification: H-004			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years
HLW Vitrification: H-059			
Cell leak detector	Unknown	Monitor cell sump leak detector	Daily
Cell leak detector	Unknown	Function check	Annually
Vessels in cell	NA	Visual inspection to look for evidence of corrosion, release of waste, or malfunctioning equipment	Every 5 years

NA = Not applicable

Table 6A-5. Example Cathodic Protection Inspection Schedule

Component Name	Component ID	Inspection	Frequency
Cathodic protection system	Unknown	Verify proper operation	Initial (less than 6 months after installation)
Cathodic protection system	Unknown	Verify proper operation	Annually
Sources of impressed current	Unknown	Test for proper function	Bi-monthly

Table 6A-6. Example Ignitable or Reactive Wastes Inspection Schedule

Component Name	Component ID	Inspection	Frequency
LAW receipt tanks V11020A, V11020B, V11020C, V11020D, V11020E, and V11020F	NA	Inspect, by qualified personnel or in the presence of fire marshal, for compliance with Uniform Fire Code and enter inspection into operating record	365 days
HLW receipt tanks V12001A, V12001B, V12001C, V12001D, V12001E, and V12001F	NA	Inspect, by professional person or in the presence of fire marshal, for compliance with Uniform Fire Code and enter inspection into operating record	365 days
Containers and container storage areas storing ignitable or reactive waste	NA	Inspect, by professional person or in the presence of fire marshall, for compliance with Uniform Fire Code and enter inspection into operating record. Inspect containers and container storage areas for compliance with WAC 173-303-630(8) requirements.	365 days

NA = Not applicable

Table 6A-7. Example Miscellaneous Unit Inspection Schedule

Component Name	Component ID	Inspection	Frequency
LAW: locally shielded melter (LSM)	Unknown	Visual; problems to look for will be added as design evolves and we know what is visible.	Daily
LSM leak detector	Unknown	Instrument or device to detect leak from melter is functioning properly	Daily
LSM leak detector instrument or device function test	Unknown	Test instrument or device to ensure it is functioning properly	Quarterly
LSM level detector	Unknown	Device monitors waste level inside melter	Daily monitoring
LSM level detector	Unknown	Test level detector to ensure correct functioning	Quarterly
LSM plenum pressure device	Unknown	Device monitors melter plenum for pressure	Daily monitoring
LSM plenum pressure device	Unknown	Test plenum pressure device to ensure correction functioning	Quarterly
LSM automatic waste feed cutoff system	Unknown	Test initiation processing and parts of the logic of the melter feed trip system (no actual trip)	Monthly
LSM automatic waste feed cutoff system	Unknown	Full test of automatic waste feed cutoff system from detection to actuation of trip to cutoff feed to melter	Annually
HLW melter	Unknown	Visual via cave window or CCTV. Look at melter top and service connections for damage or abnormalities; check for leaks	Daily
HLW melter	Unknown	Visual via CCTV of. Look for	Daily
HLW melter cave sump leak detector	Unknown	Instrument or device to detect leak from melter	Daily
HLW melter cave sump leak detector device	Unknown	Test instrument or device to ensure it is functioning properly	Quarterly
HLW melter level detector	Unknown	Device monitors waste level inside melter	Daily monitoring
HLW melter level detector device	Unknown	Test level detector to ensure correct functioning	Quarterly
HLW melter plenum pressure	Unknown	Device monitors melter plenum for pressure	Daily monitoring
HLW melter plenum pressure device	Unknown	Test plenum pressure device to ensure correction functioning	Quarterly
HLW melter automatic waste feed cutoff system	Unknown	Test initiation processing and parts of the logic of the melter feed trip system (no actual trip)	Monthly
HLW melter automatic waste feed cutoff system	Unknown	Full test of automatic waste feed cutoff system from detection to actuation of trip to cutoff feed to melter	Annually

Table 6A-8. Example Containment Buildings Inspection Schedule

Component Name	Component ID	Inspection	Frequency
Pretreatment Plant			
Pretreatment C3 workshop containment building			
Area surrounding containment building	NA	Visual to detect signs of releases of hazardous waste	Weekly
Primary barrier (floor)	NA	Visual; look for significant cracks, gaps, corrosion or other signs of deterioration, look for liquid on floor	Weekly
Pretreatment maintenance containment building			
Area surrounding containment building	NA	Visual to detect signs of releases of hazardous waste	Weekly
Primary barrier (floor)	NA	Visual; look for significant cracks, gaps, corrosion or other signs of deterioration, look for liquid on floor	Weekly
LAW Vitrification Plant			
LAW LSM gallery containment building			
Area surrounding containment building	NA	Visual to detect signs of releases of hazardous waste	Weekly
Primary barrier (floor)	NA	Visual; look for significant cracks, gaps, corrosion or other signs of deterioration, look for liquid on floor	Weekly
ILAW container finishing containment building			
Area surrounding containment building	NA	Visual to detect signs of releases of hazardous waste	Weekly
Primary barrier (floor)	NA	Visual; look for significant cracks, gaps, corrosion or other signs of deterioration, look for liquid on floor	Weekly
LAW Vitrification Plant C3 Workshop Containment Building			
Area surrounding containment building	NA	Visual to detect signs of releases of hazardous waste	Weekly
Primary barrier (floor)	NA	Visual; look for significant cracks, gaps, corrosion or other signs of deterioration, look for liquid on floor	Weekly

Table 6A-8. Example Containment Buildings Inspection Schedule

Component Name	Component ID	Inspection	Frequency
HLW Vitrification Plant			
HLW Melter containment building			
Area surrounding containment building	NA	Visual to detect signs of releases of hazardous waste	Weekly
Primary barrier (floor)	NA	Visual; look for significant cracks, gaps, corrosion or other signs of deterioration, look for liquid on floor	Weekly
IHLW container weld containment building			
Area surrounding containment building	NA	Visual to detect signs of releases of hazardous waste	Weekly
Primary barrier (floor)	NA	Visual; look for significant cracks, gaps, corrosion or other signs of deterioration, look for liquid on floor	Weekly
IHLW container decontamination building			
Area surrounding containment building	NA	Visual to detect signs of releases of hazardous waste	Weekly
Primary barrier (floor)	NA	Visual; look for significant cracks, gaps, corrosion or other signs of deterioration, look for liquid on floor	Weekly
HLW Vitrification Plant C3 Workshop Containment Building			
Area surrounding containment building	NA	Visual to detect signs of releases of hazardous waste	Weekly
Primary barrier (floor)	NA	Visual; look for significant cracks, gaps, corrosion or other signs of deterioration, look for liquid on floor	Weekly

Appendix 7A

Appendix 7A
RPP–WTP Emergency Management Plan

BNFL Inc.

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Contents

Item | Page Number

Acronyms and Abbreviations x

1. Introduction 1

1.1. Purpose 1

1.2. Scope 1

1.3. Concept of Operation 2
1.3.1. Emergency Management Program Elements 3
1.3.2. Emergency Management Program Basis 3

1.4. Emergency Preparedness Hazards Assessment 3
1.4.1. Emergency Response 3

1.5. Hanford Site and RPP-WTP Descriptions 5
1.5.1. Hanford Site Description 5
1.5.2. RPP-WTP Description [G-1] 5

1.6. RPP-WTP Hazards 7
1.6.1. RPP-WTP Hazardous Materials 7
1.6.2. Dangerous Waste and Dangerous Waste Constituents 8
1.6.3. RPP-WTP Industrial Hazards 8
1.6.4. RPP-WTP General Response to Hazards 8

2. Emergency Response Organization 14

2.1. Purpose 14

2.2. Scope 14

2.3. Hanford Site ERO [G-4d(1), G-4a(2)] 14
2.3.1 Incident Command Organization [G-4a(2)] 15
2.3.2 Facility Emergency Response Organization [G-2, G-4a, G-4d(2), G-4e(1), G-4e(5), G-8a] 15
2.3.3 Hanford Fire Department [G-6] 18
2.3.4 Hanford Patrol [G-6] 18
2.3.5 Other Emergency Response Support Personnel 18
2.3.6 Hanford Emergency Operations Center 19
2.3.7 Joint Information Center 19

3. Hanford Site and Offsite Response Interfaces 20

3.1. Purpose 20

3.2. Scope 20

3.3. Responsibilities 20
3.3.1. Hanford Site Interfaces 20
3.3.2. Offsite Interfaces 20

3.4. Planning and Preparedness 21

3.5. Response and Recovery 21
3.6. Documentation 21
4. Event Categorization and Classification 22
4.1. Purpose 22
4.2. Scope 22
4.3. Event Categories 22
4.3.1. Operational Emergency 22
4.3.2. Abnormal Event [G-3, G-4] 24
4.4. Emergency Action Level 25
4.4.1. Emergency Action Level Development 25
4.4.2. Use of Emergency Action Levels 25
4.5. Hazards Surveys and Hazards Assessments 26
4.5.1. Hazards Survey Process 26
4.5.2. Hazards Assessment Process [G-4c] 26
4.5.3. Hazards Assessment Development 27
5. Notifications and Communications 30
5.1. Purpose 30
5.2. Scope 30
5.3. Responsibilities 30
5.4. Notifications 30
5.5. Operational Emergency Notifications 30
5.5.1. Initial Onsite and Offsite Notifications 31
5.5.2. Reclassification Notifications 31
5.5.3. Emergency Termination Notifications 32
5.6. Abnormal Event Notifications [G-4c(2)] 32
5.7. Environmental Notifications [G-8b(1)] 32
5.7.1. Initial/Verbal Notifications [G-4a(2)], [G-8a] 32
5.7.2. Written Reports [G-8b(2)] 32
5.7.3. Resumption of Operations [G-8b(3)], [G-4e(6)] 33
5.8. Communications 33
5.8.1. Control Room Communications (Initiating and Receiving Emergency Notifications) 33
5.8.2. RPP-WTP Incident Command Post (Initiating and Receiving Emergency Notifications) 33
5.8.3. Environmental Point of Contact 33
5.8.4. RPP-WTP Facility Alarms 33
5.9. Hanford Site Communications 34
5.9.1. Hanford Site Alarms (Emergency Signals) 34
6. Consequence Assessment 37
6.1. Purpose 37
6.2. Scope 37
6.3. Consequence Determination [G-4b, G-4c(1)] 37
6.3.1. Meteorological Monitoring 37

6.3.2. Water/Groundwater Monitoring 38
6.3.3. Event Scene Consequence Assessments 38
6.3.4. Area Consequence Assessments 38

6.4. Coordination Of Consequence Assessment Results 38

7. Protective Actions 39

7.1. Purpose 39

7.2. Scope 39

7.3. Emergency Planning Zones 39
7.3.1. Plume Exposure Pathway Emergency Planning Zones 39
7.3.2. Ingestion Exposure Pathway Emergency Planning Zone 39

7.4. Protective Actions 39
7.4.1. Protective Action Guides 40
7.4.2. Emergency Response Planning Guidelines for Nonradiological Releases 41

7.5. Hanford Site Protective Actions 41

7.6. RPP-WTP Protective Actions [G-4a(1)] 41

7.7. Essential Personnel (Safety Shutdown Responsibilities) 42

7.8. Personnel Accountability 43

7.9. Access Control 43

7.10. Take Cover 43
7.10.1. Hanford Site Take Cover 43
7.10.2. RPP-WTP Facility Take Cover 43

7.11. Sheltering 43

7.12. Evacuation 43
7.12.1. Hanford Site Evacuation 43
7.12.2. RPP-WTP Facility Evacuation [G-7] 44
7.12.3. Offsite Protective Action Recommendations 44
7.12.4. Termination of Protective Actions 44

8. Emergency Medical Support [G-6] 49

8.1. Purpose 49
8.1.1. Scope 49

8.2. Emergency Medical Responsibilities 49
8.2.1. Hanford Fire Department 49
8.2.2. Hanford Environmental Health Foundation 49
8.2.3. Hanford Patrol 49
8.2.4. Hanford Internal and External Dosimetry and Whole Body Counting Programs 49
8.2.5. Other Hanford Site Contractors 50
8.2.6. Local Hospitals 50

8.3. Medical Emergency Facilities And Equipment 50
8.3.1. Health Care Center 50
8.3.2. Emergency Decontamination Facility 50
8.3.3. Decontamination Equipment 50
8.3.4. Medical Emergency Equipment 50
8.3.5. Medical Emergency Transportation 50

8.3.6. Offsite Medical Facilities 50

8.4. Medical Emergency Communications 51

9. Emergency Termination, Reentry and Recovery 52

9.1. Purpose 52

9.2. Scope 52

9.3. Termination of the Emergency 52

9.4. Reentry 52
9.4.1. Reentry Exposure Considerations 53

9.5. Recovery Planning 53
9.5.1. Planning and Operations for Hanford Site Recovery 53
9.5.2. Planning and Operations for Offsite Recovery 53
9.5.3. Incompatible Waste [G-4e(1), G-4e(2)] 54
9.5.4. Facility Configuration [G-4e(3), G-4e(4)] 55

10. Public Information 56

10.1. Purpose 56

10.2. Scope 56

10.3. Emergency Public Information Program 56

10.4. Emergency Public Information Organization 56
10.4.1. Policy Team 56
10.4.2. Joint Information Center 56

10.5. Public Education 57
10.5.1. Plume Emergency Planning Zone Public Education 58
10.5.2. Ingestion Emergency Planning Zone Public Education 58

11. Emergency Facilities and Equipment 59

11.1. Purpose 59

11.2. Scope 59

11.3. Emergency Facilities 59
11.3.1. Hanford Emergency Operations Center 59
11.3.2. Hanford Patrol Operations Center 59
11.3.3. Occurrence Notification Center 59
11.3.4. Emergency Medical Facilities 59
11.3.5. State and County Emergency Operations Centers 60
11.3.6. RPP-WTP Emergency Facilities 60

11.4. RPP-WTP Emergency Equipment (G-5) 60
11.4.2. Emergency Protective Equipment 61

11.5. Hanford Site Emergency Resources 61
11.5.1. Emergency Equipment 61
11.5.2. Hanford Patrol 62
11.5.3. Hanford Fire Department 62

11.6. Maintenance and Testing of Alarm and Communication Systems 62

11.7. Inventory of Emergency Equipment 62

12. Training 64
12.1. Purpose 64
12.2. Scope 64
12.3. Training Requirements 64
12.4. Offsite Personnel Training 64
13. Exercises and Drills 65
13.1. Purpose 65
13.2. Scope 65
13.3. Exercise Program 65
13.4. Exercise Definitions 66
13.4.1. Limited Exercise 66
13.4.2. Field Exercise 66
13.5. Exercise Development and Conduct 66
13.5.1. Development 66
13.5.2. Conduct 67
13.6. Exercise Evaluation and Corrective Action 67
13.7. Offsite Coordination 67
13.8. Drill Program 68
13.8.1. Drill Definitions 68
13.8.2. Drill Development and Conduct 68
13.8.3. Emergency Preparedness Drill Evaluation 70
14. Program Administration 71
14.1. Purpose 71
14.2. Scope 71
14.3. Emergency Management Program Administrator 71
14.4. Lessons Learned 72
14.5. Document Control 72
14.6. Annual Review 72
14.6.1. Review of Agreements 72
14.6.2. Supporting Documents 73
14.6.3. Management Assessments 73
14.7. Vital Records 73
14.8. Emergency Records 73
14.9. Emergency Plan Locations 73
References 75
Appendix A Completion Schedule ..... A-i
Appendix B RPP-WTP Regulatory Crosswalk ..... B-i

Appendix C Description of Emergency Response Procedures ..... C-i

TABLES

Table 4-1. Summary of Emergency Classifications 28
Table 4-2. RPP-WTP Emergency Classification Criteria 29
Table 5-1. Hanford Site Emergency Signals. 35
Table 7-1. Staging Area and Shelter Locations 45
Table B-1. Hanford Site Documentation Crosswalk Matrix B-1

FIGURES

Figure 1-1. Emergency Response 9
Figure 1-2. Hanford Site Map 10
Figure 1-3. Location of the RPP-WTP on the Hanford Site 11
Figure 1-4. Location of the RPP-WTP Within the 200 East Area 12
Figure 1-5. Facility Layout Plan of the RPP-WTP 13
Figure 5-1. RPP-WTP Emergency/Abnormal Notification Flow Diagram 36
Figure 7-1. RPP-WTP Plume Exposure Emergency Planning Zone 46
Figure 7-2. RPP-WTP Evacuation Routes 47
Figure 7-3. Hanford Site Evacuation Routes 48
Figure 11-1. RPP-WTP Emergency Facilities 63

Acronyms and Abbreviations

BED	building emergency director
CFR	*Code of Federal Regulations*
DOE	US Department of Energy
DOE-ORP	US Department of Energy Office of River Protection
DOE-HQ	US Department of Energy headquarters
DOE-RL	US Department of Energy, Richland Office
DWPA	RPP-WTP *Dangerous Waste Permit Application*
EAL	emergency action level
EAS	emergency alert system
Ecology	Washington State Department of Ecology
EDF	emergency decontamination facility
ENS	emergency notification system
EOC	emergency operations center
EPA	US Environmental Protection Agency
EPOC	RPP-WTP environmental point of contact
EPZ	emergency planning zone
ERO	emergency response organization
ERPG	emergency response planning guideline
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FERO	facility emergency response organization
HEHF	Hanford Environmental Health Foundation
HCC	health care center
IC	incident commander
ICP	incident command post
ICS	Incident Command System
IHLW	immobilized high-level waste
ILAW	immobilized low-activity waste
JIC	joint information center
LAW	low-activity waste
MOU	memorandum of understanding
NFPA	National Fire Protection Association
ONC	occurrence notification center
PAG	protective action guideline
PAR	protective action recommendation
POC	patrol operations center
RCRA	Resource Conservation and Recovery Act
RPP-WTP	River Protection Project - Waste Treatment Plant
RU	Regulatory Unit
TEDE	total effective dose equivalent
TSD	treatment, storage, or disposal (unit)
UDAC	Unified Dose Assessment Center
WAC	*Washington Administrative Code*

1. Introduction

1.1. Purpose

The River Protection Project - Waste Treatment Plant (RPP-WTP) *Emergency Management Plan*, incorporates into one document an overview of the emergency management program for the RPP-WTP and describes how the program coordinates with the Hanford Site. The program has been developed in accordance with applicable Federal and state regulations (including Chapter 29 of the Code Of Federal Regulations and Chapter 173-303 of the Washington Administrative Codes) and the *Hanford Emergency Management Plan*, DOE/RL-94-02, to ensure the health and safety of RPP-WTP personnel, Hanford Site employees, the public, and the environment, in the event of an emergency at or affecting the RPP-WTP.

Formalized agreements with Hanford Site services relating to emergency management will be developed where necessary to provide emergency services.

This revision of the plan recognizes the development of emergency plan implementing procedures and other functional supporting documents, that will be conducted at a later date. Place-holders for the description of such procedures or documents are included in the appropriate sections. See Appendix A for a list of all place-holders and a schedule of when each item will be completed. Upon completion of newly developed documents, this plan will be revised to incorporate the appropriate descriptions.

This Emergency Management Plan will come into affect (TBD #CP07-001).

This plan provides a description of how the RPP-WTP will implement the provisions of the applicable regulations stated above, in terms of overall policies and concept of operations. The plan will be used as the basis for the development of specific emergency plan implementing procedures.

Additionally, portions of this plan, together with the Hanford Emergency Management Plan, DOE/RL-94-02, meet contingency plan requirements, thus meeting the Washington Administrative Code WAC 173-303 requirements for the RPP-WTP Contingency plan.

Applicability of this plan to RPP-WTP activities is described in the Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit, Dangerous Waste Portion, General Condition II.A. General Condition II.A applies to Hanford Site activities at operating treatment, storage, or disposal (TSD) units, as well as RPP-WTP, including transportation incidents on the site, in accordance with the applicability matrix delineated in Attachment 3 of the Hanford Facility RCRA Permit. Contingency plan requirements from WAC 173-303-350 met in this plan are identified in each of the applicable sections and subsections using brackets "[ ]" and compiled in Appendix B.

1.2. Scope

This plan describes the overall organization, authorities, and responsibilities for response to and mitigation of emergency events involving RPP-WTP. These events include the full spectrum of operational emergencies, natural phenomena, transportation events, and security emergencies events.

The RPP-WTP will develop and maintain procedures or other documents necessary to implement the emergency management program described in this plan. RPP-WTP responders will participate in the Hanford Emergency Operations Center (EOC) as described in DOE/RL-94-02. RPP-WTP emergency plan implementing procedures contain detailed information and specific instructions, including response

actions, associated precautions and prerequisites, and identification of responsible individuals, needed to carry out the appropriate action during a drill, exercise, or actual emergency. The RPP-WTP emergency plan implementing procedures will be comparable to existing response procedures on the Hanford Site, to ensure a consistent response.

Emergency plan implementing procedures will include, but are not limited to, the following:

- The participation of RPP-WTP personnel in the Incident Command System as described in DOE/RL-94-02
- Recognition, categorization/classification, and notification of emergencies and other events
- Protective actions, both preplanned for the RPP-WTP and Hanford Site, as well as protective action recommendations (PARs) for the offsites
- Response to radiological and nonradiological hazardous substance spills or releases
- Safe Shutdown procedures
- Termination, reentry, and recovery

In addition to the program for response to and mitigation of emergencies, this plan also provides direction on the activities necessary to ensure emergency preparedness at the RPP-WTP, such as: training, drills, exercises, and assessments. The authority and responsibility for interfaces with Hanford Site and offsite organizations responsible for protecting the public and the environment, including those agencies that may provide or request support in the event of an emergency, is also delineated.

This plan follows the format of the *Hanford Emergency Management Plan*, DOE/RL-94-02. Some duplication is necessary to clarify RPP-WTP responsibilities and authorities. Unnecessary duplications are avoided and references are made to DOE/RL-94-02.

1.3. Concept of Operation

An integrated and comprehensive RPP-WTP Emergency Management Program has been developed to ensure that:

- The RPP-WTP can respond effectively and efficiently to emergencies, so that appropriate response measures are taken to protect RPP-WTP personnel, Hanford Site employees, the public, the environment
- Emergencies are promptly recognized and classified, and parameters associated with the emergency are monitored to detect changed or degraded conditions
- Emergencies are reported and notifications are made
- Reentry activities are properly and safely accomplished, and recovery and post-emergency activities commence properly

1.3.1. Emergency Management Program Elements

There are three elements of the emergency management program. These elements are:

- Emergency **planning,** which includes identification of hazards and threats, hazard mitigation, development and preparation of emergency plans and procedures, and identification of personnel and resources needed for an effective response

- Emergency **preparedness,** which includes acquisition and maintenance of resources, training, drills, and exercises

- Emergency **response,** which includes the application of resources to mitigate consequences to workers, the public, the environment, and the initiation of recovery from an emergency

1.3.2. Emergency Management Program Basis

The RPP-WTP emergency management program is based on, and commensurate with, the hazards and consequences associated with RPP-WTP; the activities at the facility (developed consistent with a graded approach); and Hanford Site facilities and transportation activities that may impact the RPP-WTP, involving radiological and nonradiological hazardous materials, dangerous waste, and dangerous waste constituents.

1.4. Emergency Preparedness Hazards Assessment

Emergency preparedness hazards assessments are used for emergency planning purposes. Emergency management efforts begin with the identification of hazards, and ensure that the scope and extent of emergency planning and preparedness are commensurate with the hazards. The development and maintenance of emergency preparedness hazards assessments are discussed in section 4.

1.4.1. Emergency Response

This section provides an overview of how the RPP-WTP responds to events. It covers the actions to be taken for an event or emergency by the event discoverer, by the facility staff, and by agencies such as the Hanford Fire Department and/or Hanford Patrol.

A graded approach is used to respond to an event, depending upon the plant process, the area of the emergency or the severity of the event. There are a number of events to which the RPP-WTP will be ready to respond, including: releases, spills, operational events, fires, explosions, natural phenomenon, and security events.

The discoverer of an event initiates the initial response. General employee response for all events or emergencies is:

- **S**top – Employee is to stop activities and place equipment in a safe configuration if safe to do so

- **W**arn – Warn others in the immediate area of the hazard(s) and also notify 911 (for immediate emergency response), the control room, and the BED

- **I**solate – Isolate the area, so others do not wander into an unknown hazard

- Minimize – Minimize exposure by moving upwind from the incident.

For some events, specific response actions to mitigate the event by the discoverer and/or facility staff may be appropriate. In such cases, actions may include shutting down systems, isolating materials, or performing other facility specific response actions, when appropriate. RPP-WTP emergency plan implementing procedures will specify actions for personnel.

In other events, resources outside the RPP-WTP may be required. In these cases, the general response approach is outlined in Figure 1-1 and requires the RPP-WTP to call the 911 emergency number. Upon being contacted, the 911 emergency center assesses the situation and notifies the primary response agency - the Hanford Fire Department or Hanford Patrol for security events – that responds and ensures implementation of the Hanford Incident Command System. The Hanford Incident Command System provides for coordination of all responders including the RPP-WTP emergency response organization (Building Emergency Director, etc.). The senior Hanford Fire Department official becomes the incident commander (IC), unless the event is determined to be primarily a security event, in which case the Hanford Patrol senior officer becomes the IC.

When the Hanford Incident Command System is established in response to an event or emergency, a coordinated effort to plan and implement additional mitigative activities commences. In addition, the consequences of the event are further analyzed and additional protective actions are implemented through the use of emergency signals, crash alarm telephone systems, and barricades, if determined necessary.

Whenever there is an event at the RPP-WTP, certain notifications are required depending upon the type and severity of the event. These notifications would include management notifications, activation of emergency response personnel, and offsite agency notifications as necessary. These notifications are described in detail in section 5 of this plan. Additional notifications described in section 5 concern those events deemed abnormal events (for example, events that do not meet emergency declaration criteria but could cause public concern or media interest). Local and state emergency management agencies, as well as state regulatory agencies, are notified for information purposes. Further, section 5 defines notifications for events described as environmental abnormal events (discoveries or events that exceed regulatory criteria), which will be made immediately to the appropriate regulator agencies.

Concurrent with the immediate notifications to the appropriate regulatory agencies, if the event is severe enough to be classified as an Alert, Site Area Emergency, or General Emergency, state and county agencies are notified within 15 minutes of declaration of the emergency. This notification allows the agencies to implement protective actions for their populations, if necessary, and to begin mobilization of resources. In addition, preplanned protective actions are implemented for the RPP-WTP and Hanford Site personnel. For emergencies classified as an Alert emergency or higher, the Hanford EOC is activated to support the Incident Command System and coordinate interface with offsite agencies.

Upon mitigation of the event to the point that the situation is stabilized and ensuring that actions have been taken to prevent reoccurrence, the event is terminated and the recovery effort begins. Recovery is the process of planning for and implementing actions to return the facility/process to pre-event conditions. Actions could include activities such as equipment repair, decontamination, proper storage of waste generated, and providing any follow-up reporting to appropriate regulatory agencies.

1.5. Hanford Site and RPP-WTP Descriptions

1.5.1. Hanford Site Description

The 1,500-square-kilometer (560-square-mile) located in Benton, Franklin, and Grant Counties, northwest of the cities of Richland, Kennewick, and Pasco (Tri-Cities). The Hanford Site was originally acquired by the Federal government in 1943 for the construction and operation of facilities to produce plutonium that was used to help end the Second World War. In 1989, the Hanford Site mission changed from one of national defense production to waste management, environmental restoration, and technology development.

The Hanford Site is also defined as a single *Resource Conservation and Recovery Act of 1976* facility, identified by the US Environmental Protection Agency (EPA)/State identification number WA7890008967, that consists of over 60 TSD units. The boundary of the Hanford Facility is described in the Hanford Site permit no. WA7890008967.

For emergency preparedness purposes, the Hanford Site is defined as the near (south and west) bank of the Columbia River from the intersection of the existing western most site boundary and the Columbia River, following the Columbia River to the south boundary of the 300 Area, and proceeding west and north along the existing site boundary (see Figure 1-4). Based on this definition, portions of the existing Hanford Site that fall within Grant and Franklin Counties are considered outside of the site boundary.

1.5.2. RPP-WTP Description [G-1]

The RPP-WTP will be a dedicated treatment plant that will store and treat mixed waste transferred from the Hanford Site tank system. Figure 1-3 shows the location of RPP-WTP in relation to Hanford Site and Figure 1-4 shows its location in the 200 East Area of the site.

RPP-WTP Owner and Operator:
BNFL Inc.
3000 George Washington Way
Richland, WA 99352

The Hanford Site, on which the RPP-WTP is built, is owned by the DOE.
US Department of Energy
Richland Operations Office
Post Office Box 550
Richland, WA 99352

1.5.2.1. RPP-WTP Facilities/Activities [G-1]

Mixed waste will be transferred from the Hanford tank system to the RPP-WTP via underground pipeline. Mixed waste and dangerous waste generated by the RPP-WTP will be further managed in one of two ways:

- Immobilized to form a durable glass waste (immobilized low-activity waste [ILAW] and immobilized high-level waste [IHLW]) for storage until disposal

- Transferred to other appropriate Hanford Site TSD facilities or to offsite storage facilities for dangerous only waste.

Two vitrification systems will be used in the RPP-WTP. One system will immobilize the pretreated LAW feed, and the second system will immobilize the pretreated HLW feed. The mixed waste constituents will be destroyed, removed, or immobilized in a durable glass matrix through the vitrification process. The ILAW and IHLW produced by the RPP-WTP will be in the form of glass monoliths sealed in steel containers. These containers will be temporarily stored at the RPP-WTP and then transferred to another Hanford Site TSD facility for storage and/or disposal.

Secondary waste will be recycled elsewhere in the RPP-WTP, transferred to TSD facilities located on the Hanford Site, or transferred offsite, as appropriate. Nonradioactive dangerous waste may also be generated by laboratory and maintenance activities. This waste will be managed at the RPP-WTP until it can be transferred to offsite TSD facilities.

The RPP-WTP will be comprised of four main buildings (plants) and several smaller support structures. These buildings and structures will include the following:

- Pretreatment and LAW pretreatment plants

  Pretreatment of the LAW feed will occur in the pretreatment and the LAW pretreatment plants. The processes in these two plants will reduce the volume of LAW feed and remove cesium, technetium, strontium, transuranic compounds and entrained solids. This is achieved using evaporation, ultrafiltration and ion exchange techniques. The HLW feed will be processed through ultrafiltration units to concentrate solids. For both LAW and HLW, tanks are used to receive waste and to provide buffer capacity between stages of the process. The Pre-treatment building will also include the main control room and a laboratory.

- LAW vitrification plant

  The LAW vitrification plant will consist of feed tanks, melters for the production of LAW glass product, the LAW melter off-gas system, as well as container shipping and storage areas for both new and glass filled containers.

- HLW vitrification plant

  The HLW Vitrification plant will consist of the HLW feed tanks, melter for production of HLW glass product and HLW melter off-gas system as well as container shipping and storage areas for both new and glass filled containers.

Each of the above facilities will have workshops, fan rooms and other equipment rooms.

Support buildings will include:

- Administration building
- Steam plant
- Diesel generator building
- Water treatment building
- Wet chemical storage building
- Melter assembly building
- Glass-former storage building
- Cooling towers
- Mixed waste storage buildings

Figure 1-5 shows the facility layout plan of the RPP-WTP, with the major buildings identified.

RPP-WTP buildings are further categorized as follows (as defined in WAC 173-303):

- Container storage areas
- Tank systems
- Miscellaneous thermal treatment units and
- Containment building units

Container storage areas will be used for storing ILAW, IHLW, and other miscellaneous dangerous and mixed waste. Miscellaneous dangerous and mixed waste generated from RPP-WTP operations will include, but not be limited to, contaminated items such as the following:

- Laboratory equipment
- Personal protective gear
- Discarded solvents and wipes
- Used equipment
- Used high-efficiency particulate air filters
- Spent ion exchange resins

Several tank systems will be used for the various steps in the pretreatment and vitrification processes. The miscellaneous thermal treatment units will include the LAW and HLW melters. The containment buildings will include the processing cells used for storage, disassembly, and packaging of failed melters.

1.6. RPP-WTP Hazards

Chemical and radiological hazards at the RPP-WTP will be identified and evaluated in the emergency preparedness hazards assessment. The following sections describes the hazardous materials at the RPP-WTP that pose significant risks to human health or to the environment.

1.6.1. RPP-WTP Hazardous Materials

Potentially hazardous materials are used for normal operations, maintenance, and support functions at the RPP-WTP. These materials could include acids, caustics, oils, diesel fuel, and solvents.

Material safety data sheets will be provided in key locations of the RPP-WTP. (TBD #CP07-002)

The following list provides a representative list of the types of hazardous materials, which will be stored and used in the RPP-WTP.

- Sodium hydroxide
- Nitric acid
- Strontium nitrate
- Sodium permanganate
- Sodium nitrate
- Urea
- Glass formers (for example: silicon oxide, boric acid, sodium borate)
- Diesel fuel
- Solvents

1.6.2. Dangerous Waste and Dangerous Waste Constituents

Hazards associated with the waste of the process may include:

- High pH causing skin irritation
- Inhalation hazards from toxicity
- Chronic illness related to the hazards
- Radiological (exposures/contamiantion)

1.6.3. RPP-WTP Industrial Hazards

Industrial hazards associated with the RPP-WTP will include:

- Electrical equipment
- Pressurized equipment and systems
- High temperature equipment
- Rotating equipment
- Confined spaces
- Forklifts
- Cranes
- Lifting operations
- Compressed gas cylinders

1.6.4. RPP-WTP General Response to Hazards

See Appendix C.

Figure 1-1. Emergency Response

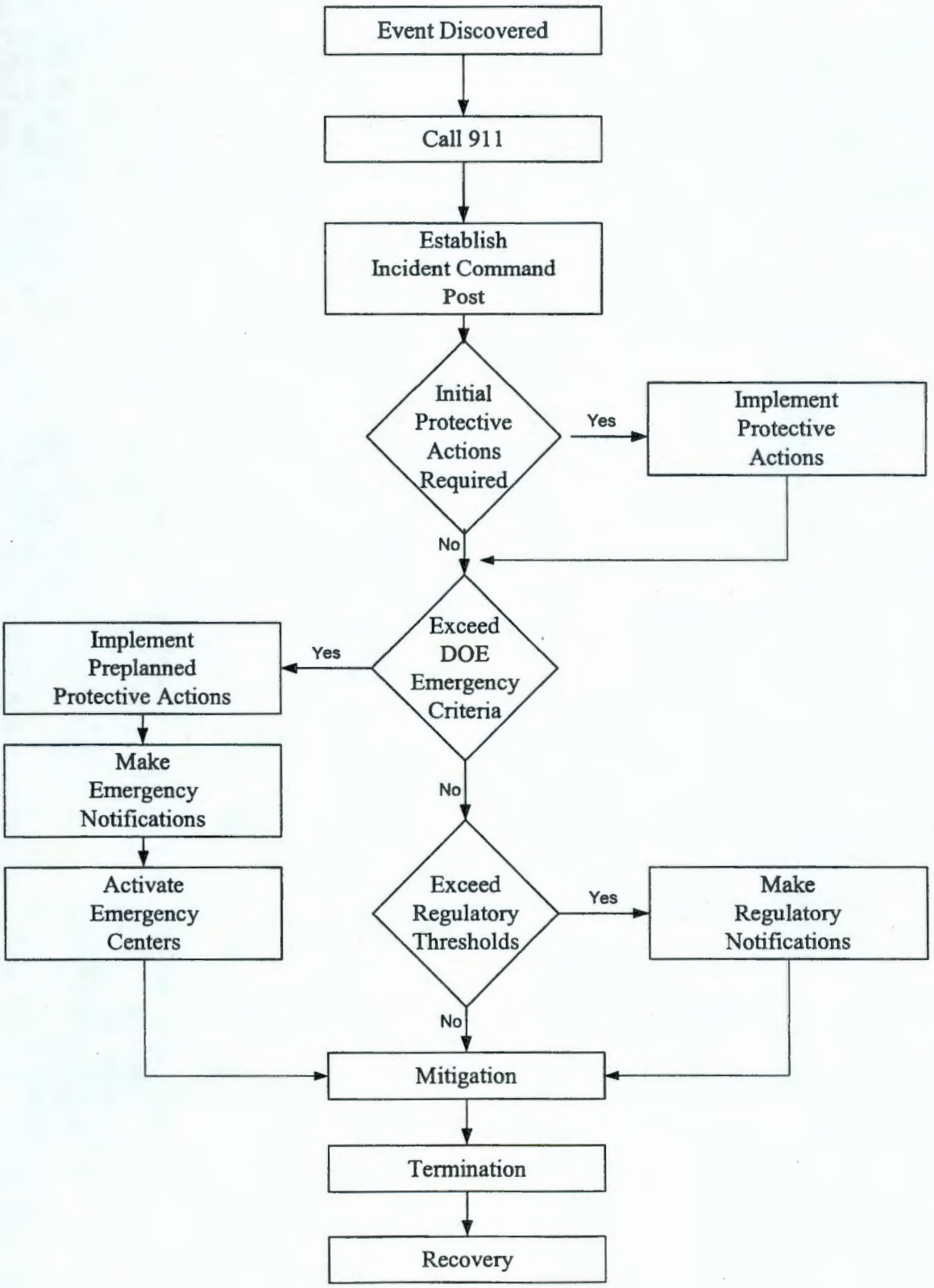
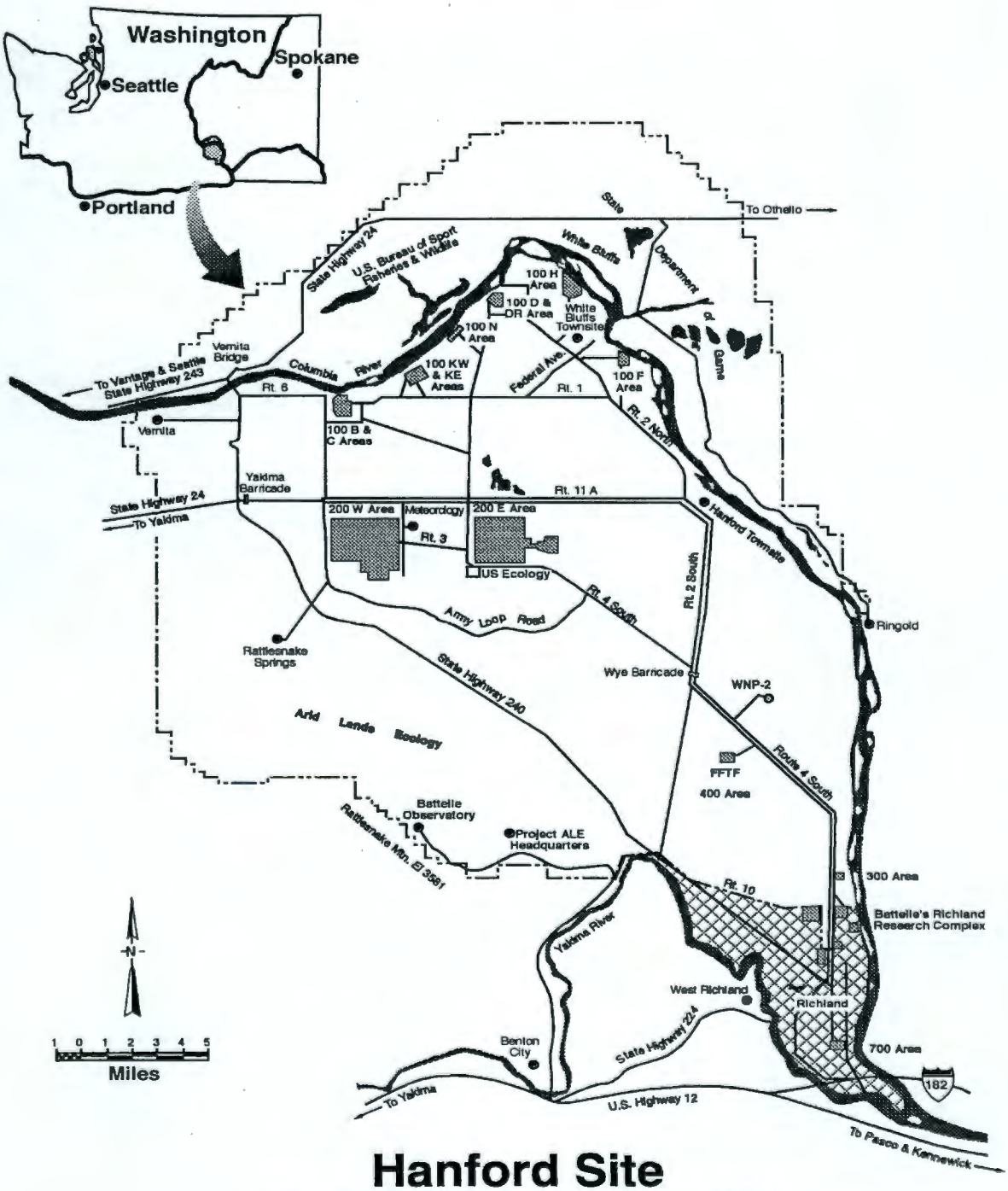


Figure 1-2. Hanford Site Map



Hanford Site
Department of Energy

H99030061.2

Figure 1-3. Location of the RPP-WTP on the Hanford Site

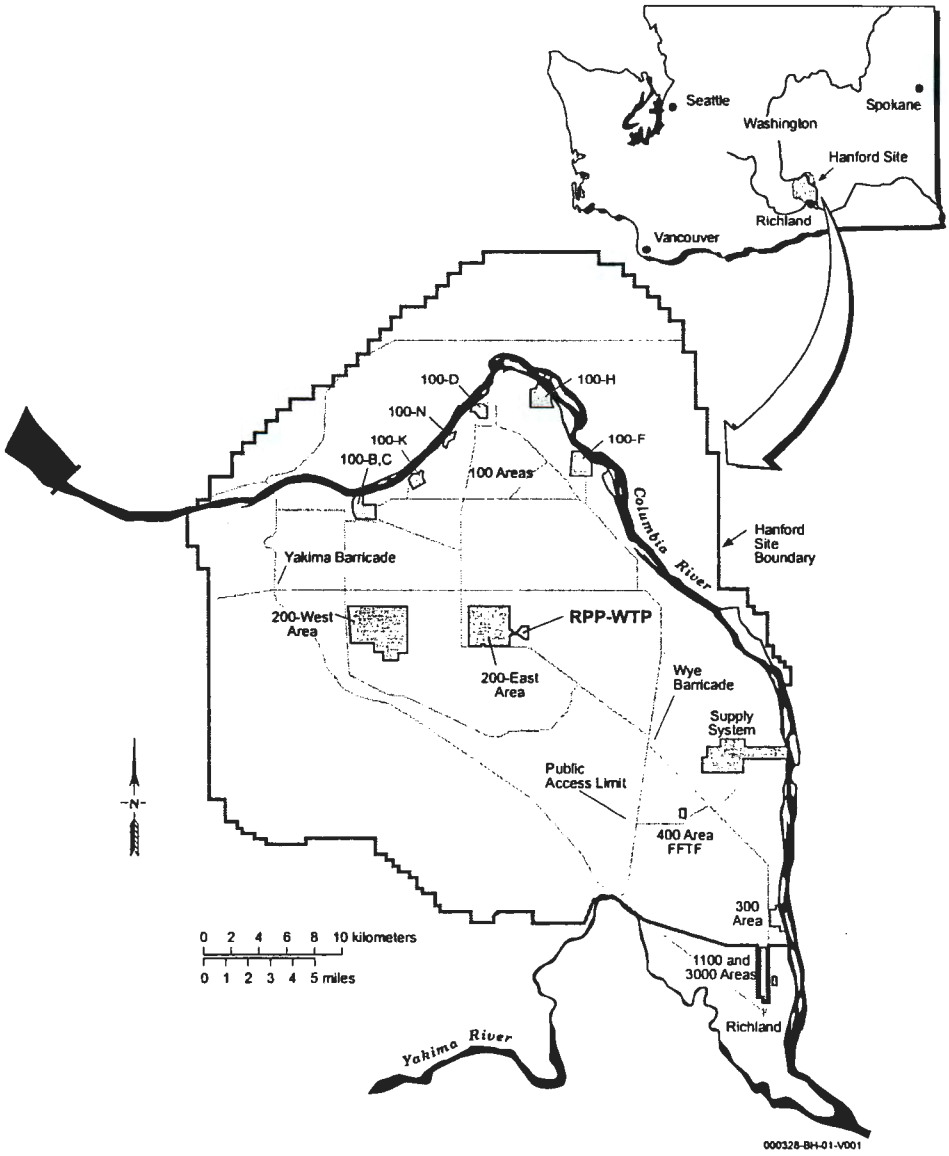


Figure 1-4. Location of the RPP-WTP Within the 200 East Area

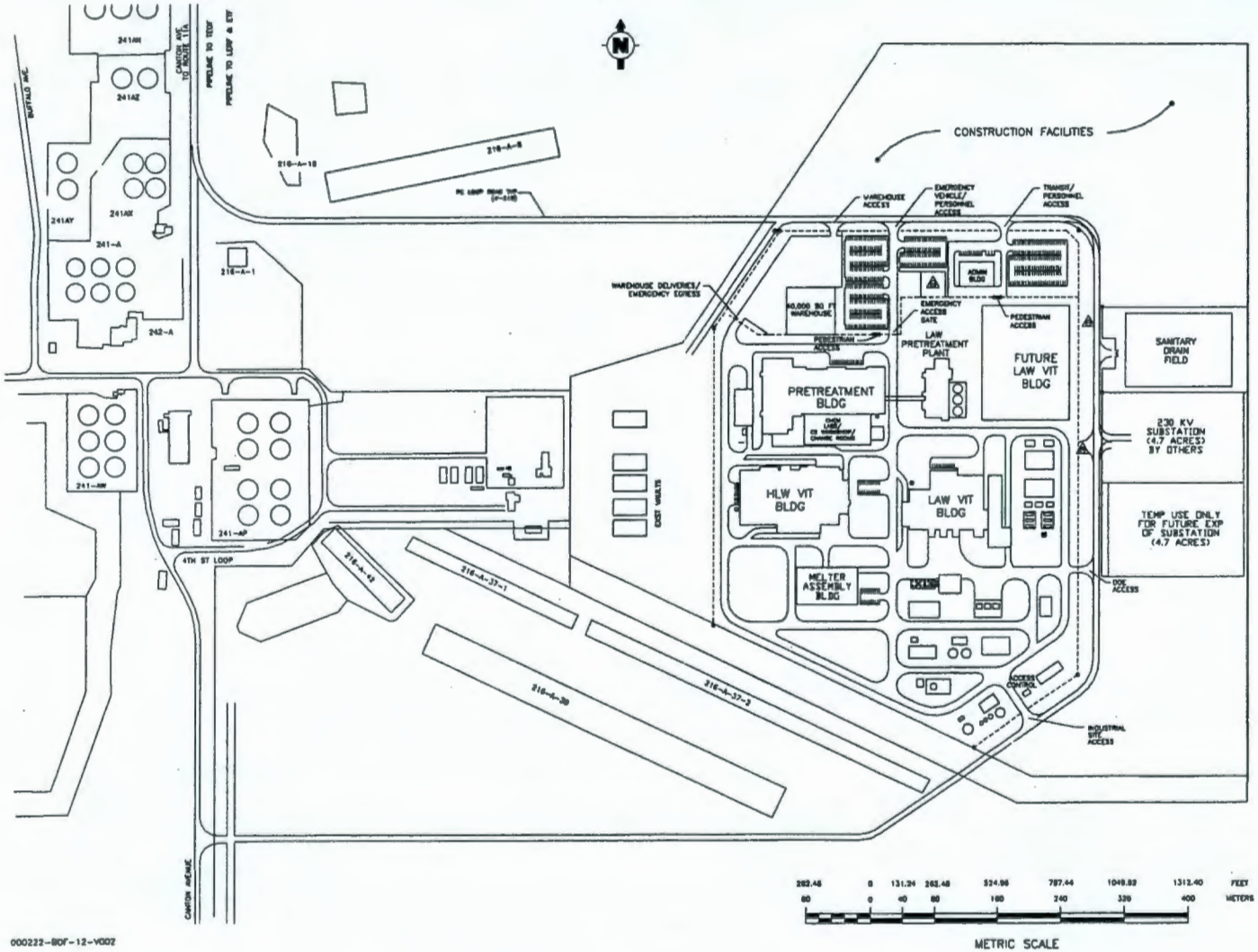
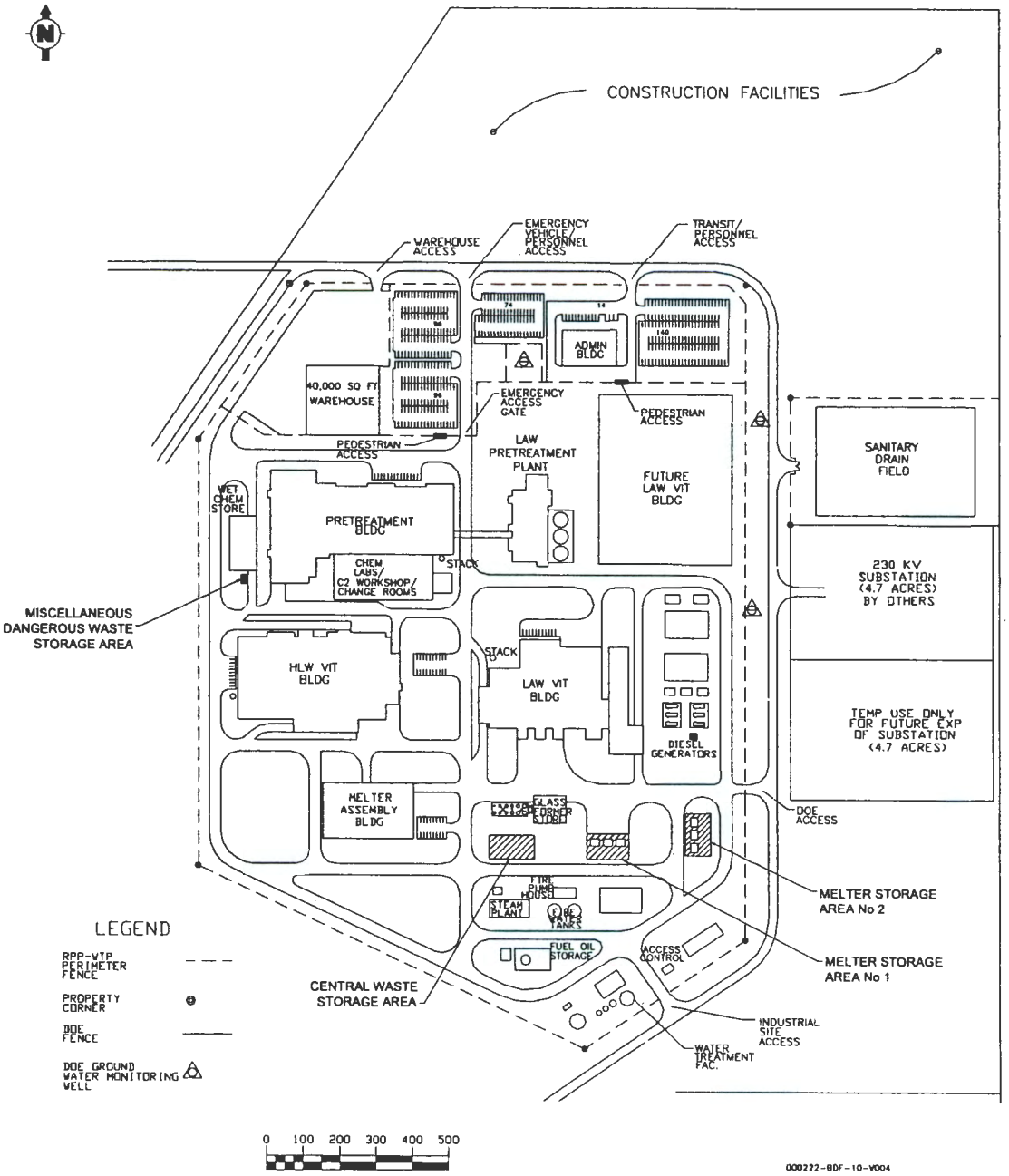


Figure 1-5. Facility Layout Plan of the RPP-WTP



2. Emergency Response Organization

2.1. Purpose

The mission of the RPP-WTP emergency response organization (ERO) is to ensure that, in the event of an emergency, actions will be taken to prevent or minimize impacts to RPP-WTP personnel, Hanford Site employees, the public, the environment, and Hanford facilities. The RPP-WTP ERO will be structured and staffed with adequate, trained personnel, including designated alternates, to enable the most timely and effective response possible, while meeting the requirements as set forth in applicable Federal, and state regulations. The RPP-WTP ERO and response organizations such as the Hanford Fire Department, are governed by the standards and regulations of the National Fire Protection Association (NFPA) and Code of Federal Regulations, as well as the Washington Administrative Code and Revised Code of Washington for emergency response, training, and on-scene emergency management. Responsibilities and tasks will be assigned to individuals identified by name, title, or position.

2.2. Scope

This chapter outlines the specific duties and responsibilities of the RPP-WTP ERO, including interrelationships with the Hanford Site ERO. Detailed ERO position descriptions are located in RPP-WTP specific emergency plan implementing procedures.

2.3. Hanford Site ERO [G-4d(1), G-4a(2)]

The Hanford Site maintains an ERO as described in DOE/RL-94-02. This ERO has two distinct components – the Incident Command Organization and the Hanford EOC – each with emergency direction and control responsibilities.

For RPP-WTP, the building emergency director (BED), on-shift at the time of the event, will be responsible for implementing appropriate emergency response procedures (for example, protective actions, event classification, notification) until arrival of the Hanford Fire Department IC, or the Hanford Patrol IC for security events. Upon arrival of the Hanford Fire Department or Hanford Patrol IC, the facility emergency response organization (FERO) becomes part of a consolidated Incident Command Organization. The BED retains responsibility for direct configuration control over facility systems and components, emergency classification and notification, while the IC assumes the overall management strategy associated with the incident (this includes requests for state and local assistance), protective action authority, and ensures that all functional areas are appropriately staffed and working cohesively towards mitigation of the incident. Trained personnel will be available on-shift to assume the duties of the RPP-WTP BED. Training, duties, and responsibilities of the BED are specified in emergency plan implementing procedures. The BED is thoroughly familiar with all aspects of the RPP-WTP contingency plan, all operations and activities at the plant, and the RPP-WTP layout, as required by WAC 173-303-360 (1).

In all events covered within the scope of this plan, the Incident Command Organization will have the authority to commit the resources needed to carry out the emergency response, and be thoroughly familiar with applicable plans and procedures, operations and activities at the facility, as well as the location and properties of all dangerous wastes handled, location of all dangerous waste inventory records within the facility, and the layout of the facility.

2.3.1 Incident Command Organization [G-4a(2)]

The Hanford Incident Command System (ICS) provides a graduated response mechanism for unusual conditions and emergencies on the Hanford Site, as described in DOE/RL-94-02.

In its most basic form, the Incident Command Organization may be staffed in its entirety by RPP-WTP personnel, as deemed necessary by the BED. In these instances, the BED coordinates emergency response efforts at the scene to include oversight of mitigation efforts, use of appropriate personal protective equipment, facility protective actions, safe shutdown of facility processes, and relevant notifications. Examples of such events that do not require assistance from outside the facility (termed incidental responses) include small releases of known substances when mitigation can be accomplished by trained on-scene personnel, minor first aid cases, non-injury contamination incidents, and non-emergency plant responses.

As described in DOE/RL-94-02, the Hanford Incident Command System enables the use of additional site contractor emergency response personnel to mitigate the event. Requests for additional Hanford Site contractor emergency response personnel are made to the patrol operations center (POC) via the 911 emergency number (or 373-3800 for cellular telephones) and, where applicable, automated alarm systems. This level of response requires the designation of an IC. The responding Hanford Fire Department senior officer for events involving fire, medical, hazardous materials, or rescue will be the IC and also fulfill the role of the senior emergency response official. The Hanford Patrol Shift Commander will act in the capacity of the IC during security incidents.

Additionally, an ICP will be established by the responding organization, as required to meet the needs of the event. The ICP will be established in a safe location near the incident scene. The FERO will initially assemble resources in a designated facility location. The IC may chose to use this location as the ICP, or will relocate FERO personnel to a new ICP location.

2.3.2 Facility Emergency Response Organization [G-2, G-4a, G-4d(2), G-4e(1), G-4e(5), G-8a]

Personnel and resources at the facility level comprise initial response capability for an emergency. The FERO directs appropriate emergency response actions, within the area under their control and at the scene of the emergency, including effective coordination with the IC and the Hanford EOC. Initial direction and control of emergency response at RPP-WTP prior to arrival of the IC is the responsibility of the FERO.

A list of all RPP-WTP BEDs will be maintained by the Hanford Site Emergency Preparedness Organization, in accordance with the Hanford Facility RCRA Permit (Dangerous Waste Portion) General

Condition II.A.4. The list will include telephone numbers (home and work) to ensure that these individuals can be reached 24 hours a day.

BEDs (primary and alternates) are assigned and trained to manage and control all aspects of the facility response and to direct the FERO at the event scene until arrival of the IC. A trained BED is be present in the RPP-WTP facility 24-hours a day, when hazardous material is present. The on-shift pre-treatment shift manager is the primary BED. The other two on-shift process shift managers are alternate BEDs. If the event is in the pre-treatment facility, one of the alternate BEDs will assume the BED role so the pre-treatment shift manager can focus on operations response activities.

Initiation of emergency lifesaving measures or support of protective actions requiring self-contained breathing apparatus (SCBA) must be performed by trained response personnel. SCBAs will be located and maintained according to emergency plan implementing procedures. RPP-WTP does not rely entirely on the Hanford Fire Department to provide such equipment on emergency response vehicles. The minimum assumption used for emergency planning for the Hanford Fire Department arrival will be 10 minutes plus travel time to destination.

The following are the ICS positions staffed by the RPP-WTP FERO:

- Building Emergency Director (BED) – overall responsibility for facility configuration control and initial protective actions, event classification, and notification.

- Facility Operations Specialist (FOS) – facility knowledgeable person sent to support the Operations Section Chief (OSC) at the event scene. Coordinates facility response with HFD response.

- Hazards Assessor (HA) – facility hazards knowledgeable person sent to support the OSC at the event scene. Coordinates information regarding hazards with OSC and ICP.

- ICP Communicator – assists the BED and the IC with communications and notifications.

- ICP Hazards Communicator – relays event specific hazards information to the Unified Dose Assessment Center (UDAC).

- Staging Area Manager (SAM) – coordinates personnel at the facility staging area. Conducts personnel accountability.

The organization, size, and emergency response duties assigned to the FERO are based on a graded approach and upon hazards at the facility, and the level necessary to support the Hanford Fire Department as the designated hazardous materials emergency response agency. In addition, the positions and responsibilities of the FERO are documented in emergency plan implementing procedures.

RPP-WTP management is responsible for:

- Assigning and ensuring the training of the FERO as necessary to support the Hanford Fire Department as the designated hazardous materials emergency response agency

- Maintaining the emergency management plan and applicable facility-specific emergency plan implementing procedures

- Ensuring that RPP-WTP personnel are aware of hazards

- Ensuring that RPP-WTP personnel are trained to respond to emergencies

The BED is authorized to commit facility resources in the event of an emergency, specific responsibilities of the BED include:

- Determining when an event has occurred or a condition exists that requires appropriate emergency event classification

- Activating internal facility alarms or communications systems, where applicable, to implement actions to protect facility personnel

- Assessing the potential or actual facility, Hanford Site, and offsite consequences of the emergency

- Contacting the POC, via the 911 emergency number, to implement predetermined Hanford Site protective actions and provide initial emergency and classification information, in accordance with emergency plan implementing procedures

- Reporting events or conditions, in accordance with applicable state and federal regulations

- Establishing an initial facility command post and assigning other Incident Command System functions in accordance with established emergency plan implementing procedures, to provide effective control of the event

- Assisting the IC, as necessary, in the mitigation of emergencies within the assigned building by:

  - Identifying the character, exact source, amount, and aerial extent of any released materials

  - Taking reasonable measures (for example, such as stopping processes/operations, collecting/containing released waste, removing/isolating containers) necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other dangerous waste

  - Monitoring for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, as appropriate

- Ensuring that facility personnel take appropriate protective actions in response to events occurring in other onsite geographic areas or adjacent facilities

The duties of the FERO include, but are not limited to,:

- Assisting in the alerting of employees of an emergency situation

- Assisting in the safe evacuation of the incident scene hazard area

- Providing immediate first-aid, if required

- Placing operating systems or controls in a safe configuration

- Implementing or supporting the implementation of protective actions for the facility population, to include roadblocks and building sweeps

- Assisting in emergency classification, and emergency notification of such classification, within established regulatory time limits

- Providing assistance to the Hanford Fire Department and/or Hanford Patrol, to include meeting and directing responders to the event scene, providing safe routes of travel, and providing immediate and constant interface, coordination, and such information as the emergency situation requires

- Serving as emergency response team members in support of the Hanford Fire Department for entry into the incident scene hazard area for mitigation, where personnel protective equipment requirements do not specify Level A or Level B dermal protection (refer to Appendix B of CFR 1910.120)

- Providing chemical monitoring and assessment, in conjunction with the Hanford Fire Department Industrial Hygienist, for emergency response

- Providing radiological monitoring and assessment for emergency response

- Providing support for chemical and/or radiological decontamination

Training requirements for the FERO are delineated in section 12, Training.

2.3.3 Hanford Fire Department [G-6]

The Hanford Fire Department is the DOE designated incident command agency for control of all hazardous materials (radiological and non-radiological) and chemical/biological incidents on the Hanford Site as described in DOE/RL-94-02.

2.3.4 Hanford Patrol [G-6]

The Hanford Patrol monitors alarm systems and provides security services, including coordination of the movement of emergency personnel through security gates, evacuation assistance, and barricade establishment where needed as described in DOE/RL-94-02. The Hanford Patrol is the designated incident command agency for security emergencies.

2.3.5 Other Emergency Response Support Personnel

Some emergency situations may require RPP-WTP or Hanford Site support personnel to be used for emergency response at the event scene who are not assigned positions within the RPP-WTP FERO. These emergency response support personnel – termed either as Skilled Support Personnel or Specialist Employees – are not trained to operate within the Hanford Incident Command System and must only be used for specific tasks defined, in the following subsections.

2.3.5.1 Skilled Support Personnel

Personnel needed to operate specific support equipment, including those within the incident scene hazard area, but who are not addressed in specific emergency response procedures, may be designated as Skilled Support Personnel. Such personnel will receive a briefing prior to commencing any work.

2.3.5.2 Specialist Employees

Safety professionals and environmental specialists who provide technical advice within their field of expertise, but are not addressed in specific emergency response procedures, may be designated as Specialist Employees. Such personnel will only provide expertise and advice to the IC when requested and may not enter the incident scene hazard area.

2.3.6 Hanford Emergency Operations Center

The Hanford EOC provides an area where personnel may convene during emergency conditions to provide essential response functions as described in DOE/RL-94-02.

RPP-WTP participation in the Hanford EOC will be required for emergencies originating at RPP-WTP. RPP-WTP management and technical personnel will go to the Hanford EOC to provide guidance to the US Department of Energy (DOE) emergency manager. The extent of RPP-WTP support is specified in RPP-WTP emergency plan implementing procedures.

2.3.7 Joint Information Center

The primary function of the joint information center (JIC) is the dissemination of accurate and timely information to the public and employees about Hanford Site activities during declared emergencies as described in DOE/RL-94-02. RPP-WTP personnel will participate in the JIC during emergencies originating at RPP-WTP. The extent of participation in the Joint Information Center by RPP-WTP is specified in the RPP-WTP emergency plan implementing procedures.

3. Hanford Site and Offsite Response Interfaces

3.1. Purpose

The purpose of this section is to describe how the RPP-WTP will interface with the Hanford Site and offsite agencies to ensure the safety and health of RPP-WTP personnel, Hanford Site employees, the public, and the environment due to an emergency at the RPP-WTP facility.

Interfaces and coordination with the Hanford Site and offsite agencies are important in the planning, preparedness, response, and recovery elements of the RPP-WTP Emergency Management Program.

3.2. Scope

To describe an overview of the relationships with other Hanford Site and offsite organizations for emergency preparedness, planning, response, and recovery purposes.

3.3. Responsibilities

RPP-WTP will support DOE in interfaces with federal, tribal, state, local, and private organizations and agencies:

- That have a responsibility to protect the public and environment within the emergency planning zone (EPZ) of the RPP-WTP facility

- With which RPP-WTP and DOE have entered into special agreements for assistance

Where appropriate, RPP-WTP will develop and maintain agreements to formalize areas of understanding, cooperation, and support with other contractors on the Hanford Site. Where DOE has already developed and maintains agreements and MOUs with states, counties, and response agencies, these areas will not be duplicated. DOE has been granted the authority as the centralized point of coordination for offsite interfaces. However, RPP-WTP will provide an emergency management administrator to coordinate activities, as necessary.

3.3.1. Hanford Site Interfaces

RPP-WTP may interface with the Hanford Site emergency management organizations by:

- Attending and participating in the Hanford Emergency Preparedness Council meetings
- Participating in planning meetings with Hanford Site response organizations
- Providing Hanford Site response organization information and tours of the RPP-WTP facility

3.3.2. Offsite Interfaces

RPP-WTP may assign personnel to attend and participate with the Local Emergency Planning Committee. In addition, RPP-WTP may participate with the Hanford Site in meetings with the Offsite agencies, as they apply to emergency preparedness, planning, and response activities.

3.4. Planning and Preparedness

Interface for planning and preparedness activities, as is determined beneficial by the parties and in support of DOE, may include:

- Coordination of emergency plans and procedures
- Periodic meetings to share information and coordinate activities
- Training opportunities related to offsite responsibilities (this task is normally conducted by DOE-RL)
- Development of agreements for support to and from offsite agencies
- Development of public information programs

3.5. Response and Recovery

In the event of an emergency on or affecting the RPP-WTP, BNFL Inc. will interface with the offsite and onsite agencies (as described in section 5) to ensure coordination and support of response and recovery activities consistent with DOE/RL-94-02. These interfaces include:

- Notification, and periodic updates to local jurisdictions within the plume EPZ, states that contain portions of the ingestion EPZ, and other agencies that may be requested to provide assistance (see section 5, Notifications and Communications)

- Communications and coordination with the Regulatory Unit (RU)

- Communications and coordination with the DOE

- Offsite representation in the Hanford EOC (see section 2)

- Provide PARs to offsite agencies (see section 5)

- Event scene interface with offsite responders (via the incident command system)

- Coordination with the Hanford Incident Command System (see section 2)

3.6. Documentation

Arrangements with state, tribal, and local agencies are documented in DOE/RL-94-02, *Hanford Emergency Management Plan*. Rather than duplicating arrangements, agreements, and MOUs, provisions have been made between BNFL Inc. and DOE to follow the above stated offsite interfaces for emergency planning, preparedness, response, and recovery.

4. Event Categorization and Classification

4.1. Purpose

Categorization and classification of events is essential to ensure that appropriate notifications and response actions are promptly initiated. Event categorization and classification criteria are developed and maintained to include events that require similar actions. The spectrum of actions triggered by categorization range from management activities that are not required to be initialized until after an event is closed out (for example, regulatory reporting), to full activation of onsite and offsite emergency response organizations.

At RPP-WTP, two categories of events are used to meet the requirements of federal and state regulations, and mutual agreements between DOE and state and county agencies. The two event categories used at RPP-WTP are: Operational Emergencies and Abnormal Events. Operational Emergencies are further divided into three classification levels: Alert, Site Area Emergency, and General Emergency.

4.2. Scope

This section describes the provisions that will be established and maintained, and the methods to be used to recognize, categorize, and classify events. Operations events that impact the safe operation of the facility and require regulatory reporting are not addressed in this plan

If an operational emergency represents a specific threat to RPP-WTP personnel, Hanford Site workers and the public due to the release or potential release of significant quantities of radiological and non-radiological hazardous materials, it will be classified as either an Alert, Site Area Emergency, or General Emergency, in order of increasing severity. The other event category, Abnormal Events, includes spills, releases, fires, and explosions that require implementation of the contingency plan per WAC 173-303, but do not reach the level of an Alert Emergency.

For RPP-WTP events, the initial event classification is made by the BED in accordance with emergency plan implementing procedures. Once the Hanford Site EOC is activated, classification authority transfers to the BNFL Inc. contractor representative in the Hanford EOC. Training on event classification is covered in BED training and discussed further in the RPP-WTP Dangerous Waste Training Plan.

The emergency classification is reviewed periodically to ensure the classification is commensurate with response activities. The criteria used to recognize and classify emergencies, called emergency action levels (EALs), are delineated in section 4.4. Emergency notification requirements are delineated in section 5.

4.3. Event Categories

4.3.1. Operational Emergency

An operational emergency is the most serious event category at RPP-WTP, and is divided into three classification levels, based upon the severity of the emergency. The DOE, as the regulatory agency for RPP-WTP, specifies three classification levels of emergencies: Alert, Site Area Emergency, and General Emergency. See Table 4-1.

4.3.1.1. Alert

An Alert will be declared when events are predicted, are in progress, or have occurred, that result in either of the following:

1 An actual or potential substantial degradation in the level of control over hazardous materials (radiological and nonradiological). The radiation dose from any release to the environment of radioactive material, or a concentration in air of other hazardous material is expected to be limited to a fraction of the applicable protective action guideline (PAG) or emergency response planning guideline (ERPG) at the facility boundary; but it is not expected that the applicable PAG or ERPG will be exceeded at or beyond the facility boundary. (See Table 4-2 for specific PAG and ERPG exposure levels.)

2 An actual or potential substantial degradation in the level of safety or security of a facility or activity that could, with further degradation, produce a Site Area Emergency or General Emergency.

At an Alert, the RPP-WTP FERO will:

- Notify and request activation of the Hanford EOC and establish communications, consultation, and liaison with offsite agencies
- Continuously assess pertinent information for decision makers, offsite agencies, the public, and other appropriate entities
- Conduct appropriate assessments, investigations, or preliminary sampling and monitoring
- Mitigate the severity of the event and its consequences
- Prepare for other response actions should the situation become more serious, requiring emergency response organizations to mobilize or activate additional resources

4.3.1.2. Site Area Emergency

A Site Area Emergency will be declared when events are predicted, in progress, or have occurred, that result in either of the following situations.

1 An actual or potential major failure of functions necessary for the protection of workers or the public. The radiation dose from any release of radioactive material or concentration in air from any release of other hazardous material is expected to be equal to or exceed the applicable PAG or ERPG exposure levels at the facility boundary but is not expected to be exceeded at or beyond the Hanford Site boundary. (See Table 4-2 for specific PAG and ERPG exposure levels).

2 Actual or potential major degradation in the level of safety or security of a facility or process that could, with further degradation, produce a General Emergency.

At a Site Area Emergency, the RPP-WTP FERO will perform the same response actions as for an Alert plus the:

- Initiation of predetermined protective actions for onsite personnel

- Provision of information to the public and the media

- Implementation of, or assistance in, any evacuations and sheltering

- Mobilization of appropriate emergency response groups or protective/security forces for immediate dispatch, should the situation become more serious

4.3.1.3. General Emergency

A General Emergency will be declared when events are predicted, in progress, or have occurred that result in the actual or imminent catastrophic reduction of facility safety or security systems, with potential for the release of large quantities of hazardous materials (radiological or non-radiological) to the environment. The radiation dose from any release of radioactive material or a concentration in air from any release of other hazardous material is expected to be equal to or exceed the applicable PAG or ERPG exposure levels at or beyond the Hanford Site boundary. (See Table 4-2 for specific PAG and ERPG exposure levels).

At a General Emergency, the RPP-WTP FERO will perform the same response actions as for a Site Area Emergency plus the notification, mobilization, and dispatch of appropriate emergency response personnel and equipment, including appropriate DOE emergency response assets, and liaison with offsite agencies for the recommendation of predetermined public protective actions.

4.3.2. Abnormal Event [G-3, G-4]

The second category of events is the Abnormal Event. An Abnormal Event includes any spill, release, fire, or explosion (including receipt of a shipment which is damaged or otherwise presents a hazard)that could threaten human health or the environment but does not generate a declared emergency. Based upon an evaluation and assessment, the BED, in consultation with the RPP-WTP Environmental Point-Of-Contact (EPOC), will determine whether the situation constitutes an Abnormal Event. It is the responsibility of the BED to make this determination, even though they consult with the EPOC.

The BED ensures that trained personnel identify the character, source, amount, and airborne extent of the spill, release, fire, or explosion to the extent possible. Identification of waste can be made by activities that can include, but are not limited to, visual inspection of involved containers, sampling activities in the field, reference to inventory records, or by consulting with RPP-WTP personnel.

After gathering appropriate event information, the hazards posed by the event to human health and the environment must be assessed. The assessment must take into consideration the direct, indirect, immediate, and long-term effects of the incident. The assessment should include sources such as Material Safety Data Sheet toxicity and health information and results from any personnel monitoring examinations conducted at medical facilities.

If assessment of all available information does not yield a definitive assessment of the danger posed by the event, a worst-case condition will be presumed and appropriate protective actions and notifications will be initiated. The BED is responsible for initiating any protective actions, based on their best judgement.

There are a variety of events or situations that may occur at RPP-WTP that, while not creating or indicating an emergency condition, may generate public concern or media interest. Local, state, and tribal agencies need timely information regarding these events in order to reassure the public that these situations do not threaten their health or safety. These may also be categorized as Abnormal Events.

RPP-WTP will work with DOE, and offsite agencies to maintain criteria that will be used to identify these situations, termed Abnormal Event.

4.4. Emergency Action Level

Emergency Action Levels (EALs) are specific, predetermined trigger points used to detect, recognize, and determine the classification of emergencies identified by the emergency preparedness hazards assessment. EALs are typically identified as either event-based or symptom-based. The distinction arises from the available methods of detecting and recognizing the initiating conditions of the event. The development of symptom-based EALs is the preferred approach, recognizing that there will usually be some initiating conditions that require an event-based approach. Initiating conditions must be identified specifically in EAL procedures and must be observable and recognizable in a timely manner by responsible personnel.

RPP-WTP facility-specific EALs will be developed for the spectrum of potential emergencies identified by the emergency preparedness hazards assessment (TBD #CP07-003). The definitions delineated in Table 4-1, used in conjunction with Table 4-2, depict the criteria used at the RPP-WTP to classify emergencies. The RPP-WTP BED makes initial classification of emergency events in accordance with EAL tables located in emergency plan implementing procedures. Event classification using EALs also forms the basis for notification and participation of offsite organizations and for determining what and when protective actions will be implemented.

4.4.1. Emergency Action Level Development

The technical basis for EALs is the RPP-WTP specific emergency preparedness hazards assessment. This hazards assessment is derived from the analysis in the Safety Analysis Report (SAR), as well as other safety related and technical documentation associated with the RPP-WTP.

The methodology for development of RPP-WTP EALs is described in the following steps:

Step 1: Using the emergency preparedness hazards assessment as the technical basis, identify the accident scenarios and consequences.

Step 2: Identify initiating conditions, barrier failures, system failures, contributing events and accident mechanisms for the scenario.

Step 3: Use the information developed in step 2 to identify specific equipment or other methods of detection.

Step 4: For detection and recognition methods that correlate directly to consequences, specific values for each emergency class are developed as necessary. These are symptom-based EALs.

Step 5: If there are no readily available methods to confirm a release, but the situation has the potential to exceed emergency criteria, the recognition of the event becomes the EAL. These are event-based EALs.

Step 6: Review and approval process.

4.4.2. Use of Emergency Action Levels

On determination that an event has occurred at the RPP-WTP. The BED promptly assesses the conditions, performs any necessary immediate protective actions, then compares the indications to the facility EAL set,

and determines the appropriate emergency classification. Once emergency classification is determined, additional protective and mitigative actions, activation of the emergency response organization, and appropriate notifications are carried out. The BED continues to assess facility conditions against the EAL criteria throughout the event.

4.5. Hazards Surveys and Hazards Assessments

Hazards surveys and hazards assessments are used for emergency planning purposes. Emergency management efforts begin with the identification of hazards and that the scope and extent of emergency planning and preparedness be commensurate with the hazards. The hazards survey briefly describes the potential impacts of emergency events or conditions and summarizes the planning and preparedness requirements that apply. The hazards assessment includes the identification and characterization of hazardous materials (radiological and nonradiological) specific to a facility or activity, analyses of potential accidents or events, and evaluation of potential consequences.

4.5.1. Hazards Survey Process.

A hazards survey (that is, qualitative examination) will be prepared to identify the conditions to be addressed by the RPP-WTP emergency management program.

The hazards survey willl:

- Identify and describe the facility or activity
- Identify for example, in matrix or tabular form the emergency conditions (for example, fires, work place accidents, natural phenomena, etc.)
- Describe the potential health, safety, or environmental impacts related to specific and surrounding facilities
- Summarize the planning and preparedness requirements that apply

Each hazards survey will be updated as necessary, but no less than every three years.

4.5.2. Hazards Assessment Process [G-4c]

A hazards assessment will be conducted to determine if an event could result in the declaration of an operational emergency as described in DOE/RL-94-02. If the results of the analysis indicate the potential for an Alert, Site Area Emergency, or General Emergency, the results of the analysis will be used to determine the necessary personnel, resources, and equipment for the emergency response. If the hazards assessment indicates that all events would be classified as less than an Alert, the minimum program requirements will encompass the requirements for Hazardous Waste Operations and Emergency Response found in 29 CFR 1910.120.

RPP-WTP will develop criteria that will be used to assess the possible hazards to human health and the environment (TBD #CP07-003). Hazardous materials are any solid, liquid, or gaseous materials that are toxic, flammable, radioactive, corrosive, chemically reactive or unstable upon prolonged storage in quantities that could pose a threat to life, property, or the environment.

In addition, the hazards assessment will include a determination of the size of the EPZ (TBD #CP07-004). The EPZ is the geographic area surrounding RPP-WTP for which special planning and preparedness actions are taken, or need to be taken, to reduce or minimize the impact to facility personnel, Hanford Site workers, and public health and safety in the event of an Operational Emergency.

4.5.3. Hazards Assessment Development

The hazards assessment development process for RPP-WTP will follow the steps as described in DOE/RL-94-02.

Table 4-1. Summary of Emergency Classifications

Emergency Classification	Facility or Process Event	Transportation Event
Alert	Actual or potential substantial degradation of level of control over radiological or nonradiological hazardous material. Releases are not expected to exceed applicable PAG or ERPG levels at or beyond the facility boundary. OR Actual or potential substantial degradation in the level of safety or security that could, with further degradation, produce a Site Area Emergency or General Emergency.	Actual or potential substantial degradation of the safety of the shipment. Exposures in excess of PAG or ERPG levels only expected for personnel engaged in cleanup, recovery and investigation.
Site Area Emergency	Actual or potential major failures of functions necessary for the protection of workers or the public. Releases could exceed applicable PAG or ERPG levels onsite but not offsite. OR Actual or potential major degradation in the level of safety or security that could, with further degradation, produce a General Emergency.	Actual or potential major reduction in safety of a shipment. Release may exceed PAG or ERPG levels beyond the exclusion zone[1] onsite but not at nearest site boundary.
General Emergency	Actual or imminent catastrophic reduction of facility safety or security systems with potential for the release of large quantities of radiological or nonradiological materials to the environment. Releases reasonably expected to exceed applicable PAG or ERPG levels offsite.	Actual or imminent catastrophic reduction in safety of a shipment. Release expected to exceed PAG or ERPG levels offsite.

[1] The exclusion zone is defined as the immediate vicinity of the accident.

Table 4-2. RPP-WTP Emergency Classification Criteria

Alert	Site Area Emergency	General Emergency
≥ ERPG[1]-1 & < ERPG-2 at the facility boundary[2].	≥ ERPG-2 at the facility boundary.	≥ ERPG-2 at the Hanford Site boundary.
≥ 100 mrem TEDE[3] at the facility boundary.	≥ 1 rem TEDE at the facility boundary.	≥ 1 rem TEDE at the Hanford Site boundary.

[1] Appropriate ERPG values or equivalent as stated in the DOE *Emergency Management Guide*. Solubility class "D" uranium compounds are limited by chemical toxicity.

[2] The facility boundary is defined as the property protection area perimeter fence when present or a distance of 100 meters from the release location unless otherwise specified in the hazards assessment documentation.

[3] The total effective dose equivalent (TEDE) includes the summation of the doses delivered from plume submersion, ground shine, and inhalation from accidental releases.

5. Notifications and Communications

5.1. Purpose

This section describes the RPP-WTP process for conducting notifications for the different types of emergencies and abnormal events (described in section 4 of this manual), and other communications pertaining to emergency preparedness, planning, response, and recovery. This section describes the notification requirements to ensure a consistent notification process with the Hanford Site (DOE/RL-94-02) and meet the appropriate federal and state notification requirements.

5.2. Scope

This section describes the responsibilities for those RPP-WTP personnel responsible for recognizing emergency or abnormal events and making notifications, and for those responsible for communications in an abnormal or emergency events. Additionally, responsibilities for preparedness and planning activities associated with notifications and communications are outlined.

5.3. Responsibilities

Each RPP-WTP employee is responsible for requesting immediate emergency responses upon discovery of an abnormal event or emergency condition. This should be done from a safe location. Initial calls will be to 911 (or 373-3800 from a cellular telephone) and/or the RPP-WTP control room. The control room is responsible for notifying the Building Emergency Director (BED).

For abnormal events not requiring immediate emergency response, personnel will notify the control room.

Emergency notification responsibilities for RPP-WTP are defined in further detail within emergency plan implementing procedures.

Responsibilities for offsite notification conducted by the ONC are defined in section 5.4 below.

5.4. Notifications

Notifications are made for events at the RPP-WTP according to the event category (Operational Emergency, or Abnormal Event). Notifications for an operational emergency supercede abnormal event notifications. Thus, when an event is classified as an operational emergency that also meets the criteria for an abnormal event, no additional initial notifications for an abnormal event will be necessary.

Notifications for abnormal and emergency events will be conducted in accordance with the Emergency Notification Flow Diagram, (Flow diagram TBD #CP07-005) which outlines how the RPP-WTP implements the required notifications for operational emergencies and abnormal events. Emergency notification will be conducted by the responsible personnel in accordance with emergency plan implementing procedures

5.5. Operational Emergency Notifications

Prompt and accurate emergency notifications are essential to mitigating the event consequences and for protecting the health and safety of workers and the public. For Operational Emergencies at the RPP-WTP, emergency plan implementing procedures will be established and maintained to provide

prompt initial notifications to workers and emergency response personnel and organizations, including appropriate offsite agencies, onsite agencies, under the most limiting set of conditions.

Notifications will be made in conformance with regulatory requirements. The notifications will be made to:

- Augment the Hanford Site and the RPP-WTP operating staff with personnel in designated response roles to respond to the emergency
- Activate emergency centers
- Facilitate public notification by offsite authorities and agencies that have decision-making authority for directing protective actions
- Protect Hanford Site and RPP-WTP personnel and emergency workers through the provisions of information necessary to implement accountability and protective actions such as: take cover, sheltering in predetermined locations, and evacuation

5.5.1. Initial Onsite and Offsite Notifications

The initial event classification (Alert, Site Area Emergency, or General Emergency) will be made by the BED, in accordance with RPP-WTP Emergency Action Level tables within emergency plan implementing procedures.

The BED will initiate immediate notifications via the 911 (373-3800 for cellular telephone) emergency number to request emergency response assistance, and to notify Hanford Site personnel via sirens and the Hanford Site crash alarm telephone system (Hanford Site sirens and crash alarm telephone system are activated by the Patrol Operations Center). Simultaneously, RPP-WTP personnel will be notified by way of the plant alarm systems, cellular telephones, plant telephones, radios, intercoms, and/or runners, to implement protective actions.

Additionally, the BED is responsible for ensuring that a completed copy of the Emergency Notification Form is transmitted to the ONC, in accordance with the emergency plan implementing procedures. If a FAX machine is not available, the BED is responsible for communicating the event information to the ONC. The ONC is then responsible for completing and transmitting the emergency notification to predetermined offsite agencies as described in DOE/RL-94-02.

5.5.2. Reclassification Notifications

Reclassification of rapidly escalating emergencies will be made by the BED until the Hanford EOC is declared operational. The notification for reclassification prior to the EOC being operational is the same as section 5.4 above.

When the Hanford EOC is declared operational, the EOC will then have the responsibility for making reclassification notifications as described in DOE/RL-94-02.

5.5.3. Emergency Termination Notifications

Notifications to those agencies initially notified of an emergency will be made upon declaration of the emergency termination. Notifications will be conducted by the ONC as directed by the Hanford EOC as described in DOE/RL-94-02.

5.6. Abnormal Event Notifications [G-4c(2)]

There are a variety of events or situations that may occur at the RPP-WTP that, while not creating or indicating emergency conditions, may generate public concern or media interest. Local, state, and tribal entities need timely information on these events in order to reassure the public that these situations do not threaten their health or safety.

The RPP-WTP BED is responsible for initiating notification of offsite entities of situations termed Abnormal Event using the Hanford process of notifications. The RPP-WTP facility will promptly report events that meet the Abnormal Event criteria to the ONC. The ONC in turn will then notify agencies as described in DOE/RL-94-02.

Environmental notifications delineated below are for those events that do not meet Operational Emergency event criteria, but notifications are still required.

5.7. Environmental Notifications [G-8b(1)]

There are numerous environmental notifications that must be made, including those for emergency plan implementation (spill, release, fire, or explosion), or permit exceedence. These notifications will be made verbally and in writing, dependent on the event type. In many cases, notification requirements are based upon quantity and location of a spill or release.

BNFL Inc. will develop and maintain procedure(s) to ensure implementation of environmental notifications in accordance with federal, state or local requirements and agreements (TBD #CP07-006). Although events relating to spills or release usually do not meet criteria for a declared emergency (that is, Alert, Site Area Emergency, or General Emergency), environmental notifications will be conducted as described in Figure 5-1. For environmental events that meet Abnormal Event criteria, notifications will follow section 5.6 above.

5.7.1. Initial/Verbal Notifications [G-4a(2)], [G-8a]

For any event which involves a spill, release, fire, explosion, or environmental permit exceedence, the EPOC will be notified by the BED to determine applicability of requirements, and to perform appropriate environmental notifications. The EPOC will notify the appropriate federal, state and/or local agencies.

5.7.2. Written Reports [G-8b(2)]

BNFL Inc. will develop any necessary written reports and submit to the DOE for review and concurrence in accordance with RPP-WTP environmental reporting procedures (TBD #CP07-006) prior to submittal to Ecology.

5.7.3. Resumption of Operations [G-8b(3)], [G-4e(6))

The RPP-WTP will notify Ecology and local agencies, as applicable, that the RPP-WTP is in compliance with cleanup activities, before operations are resumed following the implementation of the contingency plan, per WAC 173-303.

5.8. Communications

Effective communication methods will be established between event scene responders, the Incident Command Post, the applicable control room, and the Emergency Operations Center, as applicable.

The RPP-WTP FERO will have effective continuing communications that will be maintained, including back-up communications.

The RPP-WTP communications system provides for designated points of contact for receipt of notifications, and compatibility with other onsite and offsite agencies and emergency responders. The following system will ensure rapid dissemination for information received, to provide for timely and effective response actions.

5.8.1. Control Room Communications (Initiating and Receiving Emergency Notifications)

The control rooms will receive and deliver emergency notifications per emergency plan implementing procedures.

5.8.2. RPP-WTP Incident Command Post (Initiating and Receiving Emergency Notifications)

RPP-WTP will have a primary and alternate incident command post (ICP) which will have communication capabilities to facilities outside of the affected event scene (TBD #CP07-007). The Incident Commander (IC) will establish the ICP in a suitable location, to ensure communication capabilities, if the dedicated command post is uninhabitable.

ICP communication capabilities will include:

- Hard line telephones
- Incoming crash telephone system
- Radios (including Hanford Site frequencies)

5.8.3. Environmental Point of Contact

The EPOC will maintain a communication mechanism (for example, telephone, pager, or cellular telephone) in order to receive environmental notifications and to perform the notifications described in section 5.3 above.

5.8.4. RPP-WTP Facility Alarms

The RPP-WTP facility will, at a minimum have the following alarms:

- Fire alarm – evacuate a particular building due to fire or smoke.

- Building evacuation alarm – evacuate a particular building due to an emergency or abnormal event.
- Continuous air monitor – evacuate a minimum of one air space
- Public address system (PA) – information and direction to RPP-WTP personnel
- Operational alarms initiate alarm procedures

5.8.4.1. Testing and Verification

Testing and verification of RPP-WTP facility communication equipment will be in accordance with approved testing and maintenance procedures.

5.9. Hanford Site Communications

Hanford Site Communications will be utilized by RPP-WTP as appropriate and are described in DOE/RL-94-02.

5.9.1. Hanford Site Alarms (Emergency Signals)

The Hanford Site Alarms/Emergency Signals will be followed by the RPP-WTP personnel. These alarms are detailed in Table 5-1.

Table 5-1. Hanford Site Emergency Signals.

SIGNAL	MEANING	ACTIONS
Gong/electronic chime	Fire	Evacuate the building; proceed to staging area.
Steady tone on whistle, Klaxon horn, or siren	Area evacuation	Evacuate the building; proceed to the staging area. Personnel in vehicles shall proceed to the nearest staging area and report to the staging area manager.
Wavering siren or short blasts on whistle, klaxon horn or siren	Take cover (shelter)	Proceed to or stay indoors. Close all exterior doors and windows, turn off all intake ventilation (as applicable), and notify manager of whereabouts. Personnel in vehicles shall proceed to the nearest occupied building and report to facility management.
AH-00-GA horn (howler) or flashing blue light (in high noise areas)	Nuclear criticality	Run at least 100 feet from building; proceed to staging area.
Red light with ringing bell	Air contamination	Stop work activities; immediately exit the area; notify Radiological Control personnel.
Ringing of a red crash alarm telephone	Emergency communications	Lift receiver, do not speak, listen to caller, and relay message(s) to the BED and the building occupants.

Figure 5-1. RPP-WTP Emergency/Abnormal Notification Flow Diagram

(TBD #CP07-005).

6. Consequence Assessment

6.1. Purpose

Initial and continuous consequence assessments are necessary to protect RPP-WTP personnel, Hanford Site workers, the public, and the environment during a operational emergency. Consequence assessments evaluate and interpret radiological or other hazardous materials measurements, or other information, to provide a basis for decision-making. In this context, planning includes developing and preparing postulated scenarios including consequence projections for the development of onsite protective actions (PAs) and offsite PARs, and identifying personnel and resources to provide an effective response.

6.2. Scope

RPP-WTP utilizes a combination of facility consequence assessment capabilities, and existing Hanford Site resources. The RPP-WTP will have monitoring capability within the facility), and will utilize Hanford Site Field Monitoring Teams and support personnel for site-wide consequence assessment. The extent of consequence assessment capability is determined by the emergency preparedness hazards assessment, and is specified in this plan and in RPP-WTP emergency plan implementing procedures.

6.3. Consequence Determination [G-4b, G-4c(1)]

Provisions are established to adequately assess the potential or actual RPP-WTP, Hanford Site and offsite consequences of an emergency. RPP-WTP consequence assessment activities are based upon the hazards assessment and are:

- Timely throughout the emergency
- Integrated with the event classification and protective action process
- Incorporate monitoring of specific indicators and field measurements
- Coordinated with offsite agencies

The airborne release pathway typically represents the most time-urgent situation, requiring a rapid, coordinated response. Releases to aquatic and ground pathways may not have the same time-urgency; however, considerations of these pathways are a part of the consequence assessment activities.

RPP-WTP consequence assessment capabilities include, but are not limited to the following:

- Stack monitoring
- Leak detection
- Continuous air monitoring
- Tank level detection
- Portable air sampling
- Hand held radiological instrumentation
- Sampling and analysis

6.3.1. Meteorological Monitoring

Meteorological monitoring is available at the Hanford Site and is described in DOE/RL-94-02. RPP-WTP utilizes this current Hanford Site meteorological capability.

6.3.2. Water/Groundwater Monitoring

Water/groundwater monitoring is available at the Hanford Site and is described in DOE/RL-94-02. RPP-WTP utilizes current Hanford Site water/groundwater monitoring capabilities.

6.3.3. Event Scene Consequence Assessments

These assessments are conducted at the event scene by the ICP staff as described in DOE/RL-94-02.

6.3.4. Area Consequence Assessments

Area consequence assessments are available at the Hanford Site and are described in DOE/RL-94-02. RPP-WTP utilizes the capabilities of the UDAC for area consequence assessments.

6.4. Coordination Of Consequence Assessment Results

The UDAC in the Hanford EOC has the primary responsibility for overall onsite and offsite consequence assessment for the Hanford Site as described in DOE/RL-94-02.

RPP-WTP provides staff for the UDAC for an emergency originating at RPP-WTP. The extent of this staffing is specified in RPP-WTP emergency plan implementing procedures.

7. Protective Actions

7.1. Purpose

An important part of the emergency management program at the RPP-WTP and at the Hanford Site is the planning for physical measures that may be needed to protect workers and the public from adverse health affects resulting from the release of hazardous materials. The initial response to any emergency will be to immediately protect the health and safety of persons in the immediate area. Identification of released material is essential to determine appropriate protective actions. Containment, treatment, and disposal assessment will be the secondary responses. This section describes the areas that may be impacted and the protective actions that may be needed.

7.2. Scope

This section defines the responsibilities for implementation (notification) of protective actions for the RPP-WTP personnel and notifications to the Hanford Site for additional Hanford Site or offsite protective actions.

7.3. Emergency Planning Zones

Emergencies at RPP-WTP may require actions only for personnel protection at the RPP-WTP, or may include other areas on Hanford Site, and may affect offsite areas.

RPP-WTP will develop and maintain EPZ, as determined necessary by the emergency preparedness hazards assessment. The RPP-WTP EPZ will be submitted to the Hanford Site Emergency Preparedness program for incorporation into the Hanford Site Emergency Management program. The RPP-WTP EPZ will also be made available to affected states and counties for their use in emergency planning and will be submitted to the RU.

7.3.1. Plume Exposure Pathway Emergency Planning Zones

Plume exposure EPZs are developed based on exposure pathways described in DOE/RL-94-02.

A plume exposure EPZ will be determined for the RPP-WTP facility based on the radiological, nonradiological, or mixed hazards

Figure 7-1 shows the plume exposure EPZ for RPP-WTP, which is developed from the emergency preparedness hazards assessment.

7.3.2. Ingestion Exposure Pathway Emergency Planning Zone

The ingestion exposure pathway EPZ for radiological and nonradiological incidents involving Hanford Site facilities including the RPP-WTP is identified in DOE/RL-04-02.

7.4. Protective Actions

Protective actions are those actions taken to preclude or reduce the exposure of individuals to hazardous materials waste following an accidental release at RPP-WTP, or on the Hanford Site.

Initial protective actions following an accident or release at RPP-WTP will be predetermined for RPP-WTP facility personnel, Hanford Site employees, and the public and will include:

- Methods for controlling, monitoring, and maintaining records of personnel exposures to hazardous materials or dangerous waste (radiological and nonradiological)

- Plans and procedures for timely sheltering and/or evacuation of workers

- Methods for controlling access to contaminated areas and for decontaminating personnel or equipment exiting the area

- Actions to be taken to increase the effectiveness of protective actions (that is, heating, ventilation, and air conditioning shutdown during sheltering

- Methods for providing timely protective action recommendations, such as sheltering, evacuation, relocation, and food control, to appropriate offsite agencies

- PAGs and ERPGs, prepared in conformance with approved guidance applicable to the actual or potential release of hazardous materials or dangerous waste to the environment, for use in protective action decision making

- Protective actions will be evaluated throughout the event and modified as necessary, either by the BED or IC for the event scene area, and by the Hanford EOC for Hanford Site modifications

7.4.1. Protective Action Guides

PAGs are used to determine the appropriate PAR. The RPP-WTP will use the PAGs adopted by the states of Washington and Oregon, which are based on the PAGs published in the EPA 400 manual, Manual of Protective Action Guides and Protective Actions For Nuclear Incidents (EPA 1992). These PAGs are intended to apply to projected doses from exposures from airborne releases of radioactive materials and subsequent depositions during the early, intermediate, and late phases of an accident. The pathways considered include external gamma and beta dose from direct exposure to airborne materials and from deposited material, and the committed dose to internal organs from inhalation of radioactive material.

The projected dose values for initiating protective actions (evacuation or sheltering) specified by the states of Washington and Oregon is 1 rem total effective dose equivalent, where the projected dose represents the sum of the effective dose equivalent resulting from exposure to external sources and the committed effective dose equivalent from all significant inhalation pathways during the early phase. The PAG values for committed dose equivalent to the thyroid and the skin are 5 and 50 times larger, respectively.

The EPA PAGs are stated in terms of committed dose. Dose incurred prior to initiation of protective action (and after the early phase of an event) normally are not included when considering whether or not to take protective actions. In other words, it is intended that the PAG values be compared to the dose that can be avoided by taking protective actions.

The PAG acronym used in this plan shall be interpreted to mean where the total effective dose equivalent of 1 rem to standard man is the sum of the effective dose equivalent from exposure to external sources and the committed effective dose equivalent from inhalation during the early phase.

Response levels corresponding to these PAGs shall be derived for the specific radionuclides, foodstuffs, and animal feeds of interest, according to the FDA recommendations.

7.4.2. Emergency Response Planning Guidelines for Nonradiological Releases

The RPP-WTP facility will use the ERPGs for nonradiological releases as described in DOE/RL-94-02. Within the ERPG system, the three values are defined below for each material.

7.4.2.1. Emergency Response Planning Guidelines 1 (ERPG-1)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor.

7.4.2.2. Emergency Response Planning Guidelines 2 (ERPG-2)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action.

7.4.2.3. Emergency Response Planning Guidelines 3 (ERPG-3)

The maximum airborne concentration, below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing life-threatening health effects.

For purposes of applying consistency with the Hanford Site Operational Emergency classification (declared emergency), the terms ERPG and appropriate ERPG exposure levels will be interpreted to mean:

- A 15-minute time weighted average concentration of the substance in air that equals or exceeds the published ERPG-2 values, or its alternative value, for that substance.

For the purpose of protective actions in response to nonradiological releases, the protective actions prescribed in the 1996 North American Emergency Response Guidebook will be implemented as applicable.

7.5. Hanford Site Protective Actions

Protective actions implemented outside the RPP-WTP are implemented by the Hanford EOC, when operational, or by the IC prior to EOC activation as described in DOE/RL-94-02.

7.6. RPP-WTP Protective Actions [G-4a(1)]

The RPP-WTP emergency plan implementing procedures will provide for the immediate actions to be taken to prevent or reduce exposures. These procedures, which are implemented by the BED and other trained RPP-WTP responders, include provisions for:

- RPP-WTP take cover to include shutdown, when appropriate, of heating, ventilation, and air-conditioning systems

- RPP-WTP facility and or specific RPP-WTP building evacuation, including persons with permanent or temporary disabilities

- Ensuring that RPP-WTP FERO are equipped with adequate dosimetry equipment to allow for the accurate evaluation of their exposures

- Controlling and monitoring radiation and hazardous material, exposures to RPP-WTP FERO as low as reasonably achievable (ALARA)

- Emergency communications to RPP-WTP personnel

- Informing the POC (911) whenever the RPP-WTP facility take cover or evacuation sirens are activated

- Shutdown of operations or other essential safe shutdown operating actions

- Identification of essential personnel

- Identification of potentially exposed personnel and ensuring they receive appropriate follow-up evaluation

- Predetermined RPP-WTP and specific building evacuation routes, staging areas, and transportation in the event of an area or Hanford Site evacuation

- Protective equipment, monitoring, and decontamination capabilities for hazardous materials or present at the RPP-WTP facility

- Access control

- Personnel accountability

- The RPP-WTP BED and/or management will ensure a process is established to effectively communicate protective actions to personnel assigned to work in remote locations of the facility, personnel working in areas of high noise and other areas or locations without alarm/siren capabilities

Each employee is responsible for his/her own health and safety and for taking appropriate actions in accordance with emergency signals and/or instructions.

Each administrative building at RPP-WTP will have work place postings providing employees emergency response information.

7.7. Essential Personnel (Safety Shutdown Responsibilities)

Essential personnel who perform safety shutdown duties prior to taking protective actions may respond differently than other personnel. The BED will be responsible for the safety of identified essential personnel during these activities.

7.8. Personnel Accountability

The RPP-WTP will provide for a personnel accountability system commensurate with the hazards associated with the processes and which will be implemented in accordance with emergency plan implementing procedures.

Personnel accountability will be conducted immediately after emergency protective actions have been implemented. Accountability will be conducted within 30 minutes from initiation of the protective action.

7.9. Access Control

During an emergency, access will be controlled to impacted areas. The Emergency Plan implementing procedures will address the need to allow emergency personnel access to controlled areas as necessary, logging entries, providing dose assessments, and maintaining exposure records for RPP-WTP emergency workers.

7.10. Take Cover

7.10.1. Hanford Site Take Cover

Upon notification by RPP-WTP, consideration of an area or site take cover will be made by Hanford Patrol and RL/ORP as described in DOE/RL-94-02.

7.10.2. RPP-WTP Facility Take Cover

RPP-WTP emergency plan implementing procedures are maintained to implement protective actions. Take cover in place will be implemented when hazards and the movement of personnel may pose a risk. The RPP-WTP BED is responsible for implementing a take cover, either when notified via crash telephone or when RPP-WTP specific implementing procedures require immediate actions.

7.11. Sheltering

Personnel will be sheltered in pre designated shelters, if time allows for the safe travel of personnel to these locations at the RPP-WTP facility. Sheltering personnel in specific predetermined locations will allow for personnel accountability to be conducted early in an event. See Table 7-1 for shelter locations. Implementation of sheltering will be conducted by the RPP-WTP BED per emergency plan implementing procedures.

Note: Sheltering refers to predefined locations within buildings related to a take cover, as opposed to staging areas outside of buildings for an evacuation.

7.12. Evacuation

7.12.1. Hanford Site Evacuation

Procedures are maintained by the POC and Hanford EOC to provide instructions for implementing an area or site emergency evacuation as described in DOE/RL-94-02. Evacuation routes for the Hanford Site are shown in Figure 7-3.

7.12.2. RPP-WTP Facility Evacuation [G-7]

An evacuation at RPP-WTP facility due to either a Hanford Site event or an RPP-WTP event, requires personnel in specific buildings or areas to evacuate. The BED is responsible for implementing an evacuation, either due to a Hanford emergency, or an RPP-WTP emergency. See Table 7-1 for Staging Area Locations. The following steps would be followed in the event of an evacuation of the RPP-WTP:

1 Evacuation due to a Hanford Site emergency would be implemented upon notification over the crash alarm telephone. In most cases, the facility would have been in a takecover or shelter condition and personnel accountability completed. If so, then personnel would be given the evacuation routes, secondary-staging locations, and released. If personnel accountability had not been completed, personnel would assemble in the staging area(s), until all sweeps and accountability were completed. Evacuation routes and secondary-staging locations would be provided and personnel would be released.

2 For an event at the RPP-WTP, personnel may be evacuated from a specific building to either a sheltering location or the staging area for accountability. If further evacuation is necessary, then step "1" above would be followed.

Emergency plan implementing procedures will be used at the RPP-WTP facility to implement evacuation protective actions.

7.12.3. Offsite Protective Action Recommendations

RPP-WTP will utilize the offsite protective action recommendations described in DOE/RL-94-02.

7.12.4. Termination of Protective Actions

The relaxation or lifting of protective actions at the RPP-WTP generally will be based on the facility conditions and consequence assessments. The Hanford EOC will decide when Hanford Site protective actions can be terminated. For an emergency at the RPP-WTP, termination of protective actions will be decided by the IC in consultation with the RPP-WTP BED. The EOC will provide recommendations to affected counties and states for the relaxation of offsite emergency protective actions (that is, evacuation or sheltering within the plume EPZ). The states shall be responsible for decisions on relaxation of ingestion protective actions, based on data provided by the UDAC.

Table 7-1. Staging Area and Shelter Locations

Staging Areas	Staging Area Locations
Primary Staging Area	North parking area, east of the Administration building
Alternate Staging Area	South end near the access control building (industrial site access)
Shelter Areas	**Shelter Locations**
(TBD #CP07-008)	**(TBD #CP07-008)**

Figure 7-1. RPP-WTP Plume Exposure Emergency Planning Zone

(TBD #CP07-004).

Figure 7-2. RPP-WTP Evacuation Routes

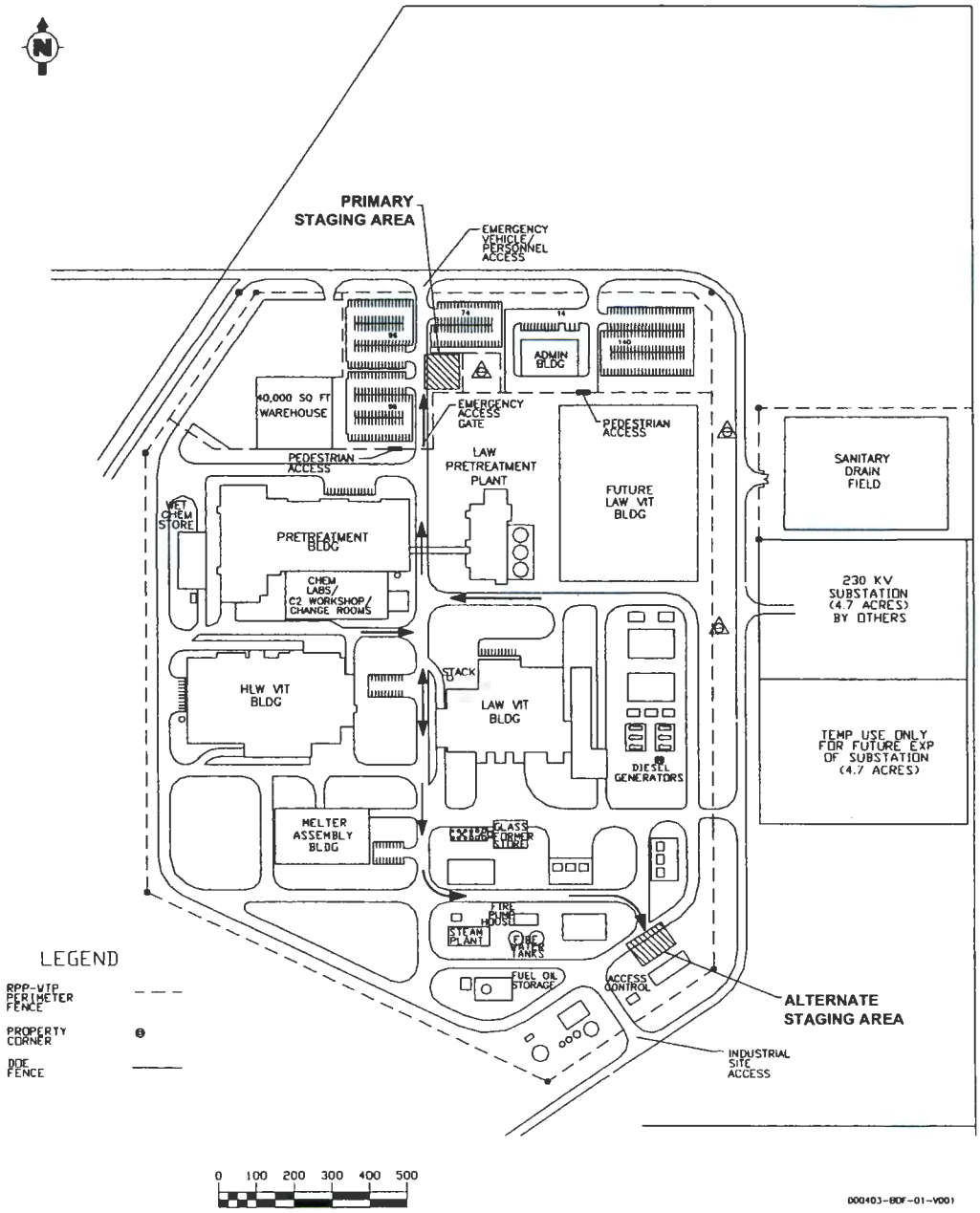
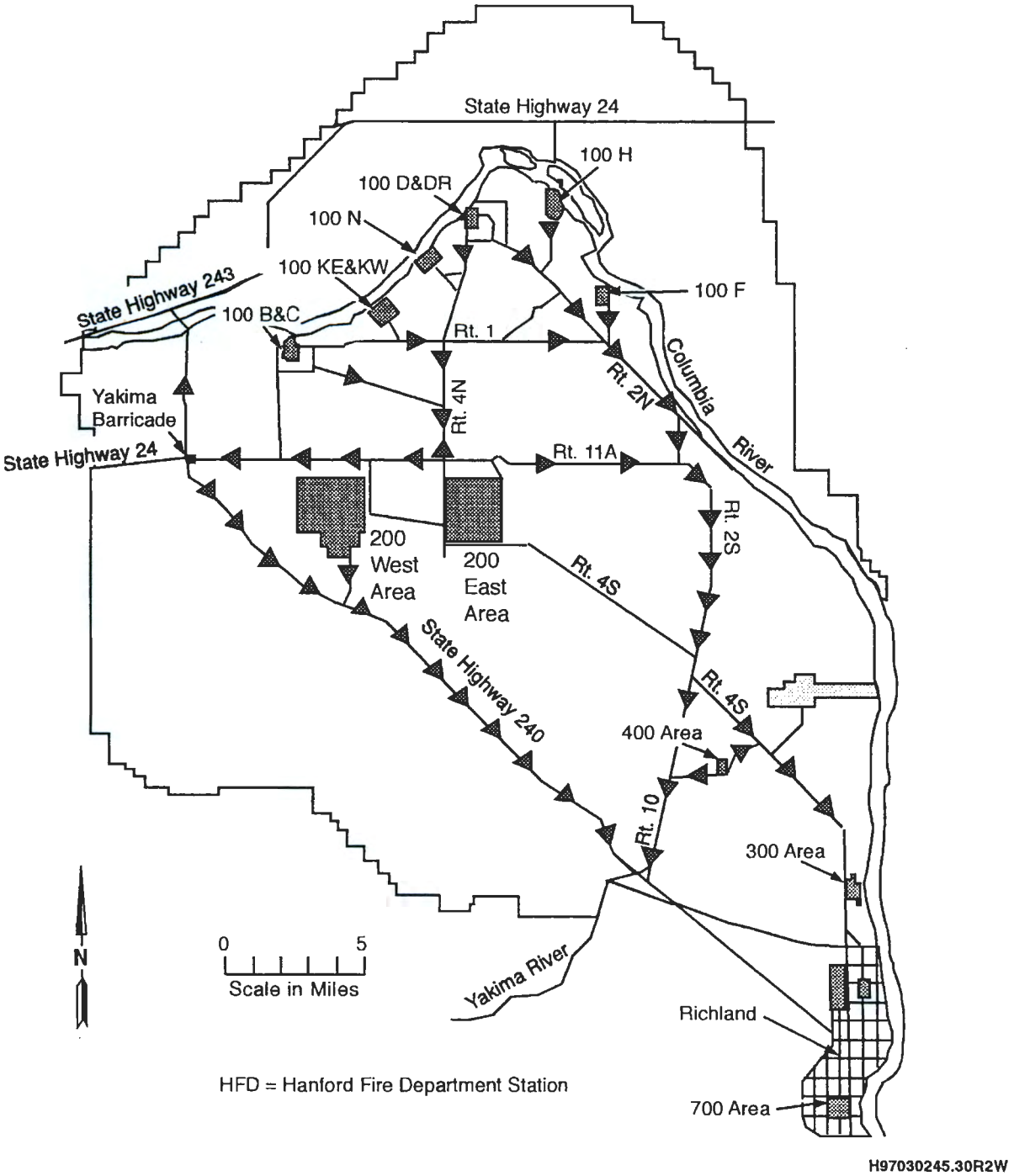


Figure 7-3. Hanford Site Evacuation Routes



8. Emergency Medical Support [G-6]

8.1. Purpose

This section describes the emergency medical responsibilities and actions for injuries that may occur at RPP-WTP and illustrates the interfaces that exist between RPP-WTP, Hanford Site, and offsite medical facilities.

8.1.1. Scope

RPP-WTP will ensure that provisions exist for emergency medical aid, triage, and decontamination, and the planning for mass casualty situations. Because of the potential for injuries to be accompanied by radiological contamination, medical support will include documented arrangements with offsite medical facilities to accept and treat contaminated, injured personnel, for emergency medical services not provided on the Hanford Site. DOE has many arrangements with offsite medical service providers, for emergencies occurring at the Hanford Site. RPP-WTP will participate in existing MOUs.

8.2. Emergency Medical Responsibilities

Medical support is planned in advance for workers contaminated by hazardous material. Hanford Site organizations are authorized by DOE to provide the medical response to onsite emergencies. Their roles and responsibilities are outlined in the following subsections. Specific procedures related to each major organization involved in site emergencies are located within documentation maintained by the respective organization.

8.2.1. Hanford Fire Department

The Hanford Fire Department provides emergency medical technicians, paramedics, and ambulance service as described in DOE/RL-94-02. This service is accessed by dialing 911.

8.2.2. Hanford Environmental Health Foundation

The primary roles of the HEHF during onsite medical emergencies are to activate and operate the emergency decontamination facility (EDF) and to provide support to the IC as requested.

8.2.3. Hanford Patrol

The Patrol Operations Center operates the site 911 emergency response system as described in DOE/RL-94-02.

8.2.4. Hanford Internal and External Dosimetry and Whole Body Counting Programs

During medical emergencies that involve internal or external radionuclide contamination, these programs provide support (such as, *in vivo* radioassays, bioassay program, exposure evaluators) to HEHF and other medical personnel to help determine the appropriate medical treatment.

8.2.5. Other Hanford Site Contractors

Agreements may be made with other Hanford Site contractors to provide health physics and radiation protection technologists and/or industrial hygienists to assist with decontamination for injuries, as appropriate. Hanford Site contractors may also provide support for transportation, security, notifications, communications, and so on, as described in respective subsections of section 2.

8.2.6. Local Hospitals

Through MOUs with DOE, Kadlec Medical Center in Richland, Kennewick General Hospital, and Our Lady of Lourdes Health Center in Pasco provide emergency health care for patients delivered by the Hanford Fire Department as described in DOE/RL-94-02.

8.3. Medical Emergency Facilities And Equipment

8.3.1. Health Care Center

RPP-WTP will have an HCC to treat patients with occupational injuries or illnesses that do not require hospitalization. The HCC will be routinely staffed by an occupational health nurse. Initial treatment for minor medical emergencies may be provided at HCC before transport to a local hospital.

8.3.2. Emergency Decontamination Facility

The EDF, located north of Kadlec Medical Center in Richland, is operated for DOE by the HEHF. The EDF is an unoccupied, hardened facility, designed to be used for patient decontamination, treatment of internal contamination, and minor medical treatment for persons who are radiologically contaminated and have minor injuries.

8.3.3. Decontamination Equipment

Decontamination equipment will be available at the RPP-WTP. Equipment or facilities range from eye wash stations, showers, and skin decontamination kits. In addition, a mobile hazardous materials decontamination unit is operated by the Hanford Fire Department.

8.3.4. Medical Emergency Equipment

Medical emergency equipment is maintained by the Hanford Fire Department as described in DOE/RL-94-02.

8.3.5. Medical Emergency Transportation

Medical emergency transportation is maintained and operated by the Hanford Fire Department as described in DOE/RL-94-02.

8.3.6. Offsite Medical Facilities

The three local hospitals, Kadlec Medical Center in Richland, Kennewick General Hospital, and Our Lady of Lourdes Health Center in Pasco, provide treatment for emergency patients from RPP-WTP; however, because of proximity, Kadlec Medical Center is the facility most often used by the facility. These hospitals have combined to provide Level Three trauma care for the community.

8.4. Medical Emergency Communications

The communications process during a Hanford medical emergency is described in DOE/RL-94-02.

9. Emergency Termination, Reentry and Recovery

9.1. Purpose

This section describes the responsibilities for termination of an emergency, reentry, and recovery planning and operations. Predetermined criteria for termination of emergencies will be developed and maintained in RPP-WTP emergency plan implementing procedures, and will be consistent with the Hanford Site emergency procedures. Reentry and recovery will include notifications associated with termination of an emergency and establishment of criteria for resumption of normal operations.

Initial reentry will be conducted under the Incident Command System. Reentry may be necessary throughout the event and for both termination and recovery planning purposes.

9.2. Scope

This section is applicable for an RPP-WTP declared emergency as related to responsibilities for reentry, recovery and termination.

9.3. Termination of the Emergency

In general, response activities are terminated when the situation has been stabilized. At this point, potential threats to RPP-WTP personnel workers, Hanford Site employees, the public, and the environment have been stabilized, conditions no longer meet established emergency categorization criteria, and it appears unlikely that conditions will deteriorate. Once the emergency has been declared terminated, activities may then focus on recovery.

In the event of a declared emergency, termination will occur after applicable criteria in emergency plan implementing procedures have been met and concurrence between the RPP-WTP Contractor Representative (DOE Hanford EOC position title held by RPP-WTP Management) and the Emergency Manager in the Hanford Emergency Operations Center (EOC) has been obtained. The BED, IC, and staff in the EOC must confer and agree that termination can be declared.

As described in DOE/RL-94-02, the Hanford EOC Emergency Manager will coordinate the termination recommendation with the state and county representatives and make the official emergency termination declaration. Termination of the emergency will then proceed in accordance with DOE/RL-94-02.

9.4. Reentry

Reentry is the act of reentering an evacuated area or building for the purpose of performing emergency activities, or to assess facility damage for the purpose of determining if the emergency can be terminated, and/or for determining the extent of required recovery activities, and/or life saving responses. Reentry can be performed at any time before termination of the emergency and during recovery activities.

Prior to event termination, the BED and IC are responsible for determining appropriate protective measures for personnel reentering the event building or area and for authorizing reentry. Reentry planning will include planning to ensure the safety of reentry personnel, such as planning for the rescue of reentry teams. All individuals involved in reentry will receive a hazards/safety briefing prior to emergency response activities, consistent with federal, state, and local laws or regulations.

The RPP-WTP BED and RPP-WTP Contractor Representative in the Hanford EOC will assist the Hanford Site Emergency Response Organization in determining the accessibility of the areas or buildings during and after the emergency, and will evaluate the advisability of reentry operations. Current operating records and other essential information for evaluating the emergency may be used in making these decisions.

After the emergency has been terminated, and during recovery activities, the RPP-WTP Recovery Manager is responsible for reentry authorization.

9.4.1. Reentry Exposure Considerations

Emergency plan implementing procedures and/or operational procedures will be maintained by RPP-WTP for estimating exposure to hazardous materials (radiological and nonradiological) and for protecting workers and the general public from exposure during reentry and recovery activities. Reentry exposure conditions will be made as described in DOE/RL-94-02.

9.5. Recovery Planning

Upon termination of the emergency, RPP-WTP and other Hanford Site organizations (as applicable) will develop and implement recovery plans in accordance with DOE/RL-94-02. Restart of operations is performed in accordance with developed and approved plans. The RU will oversee recovery planning for RPP-WTP.

Recovery planning for RPP-WTP will include dissemination of information to offsite agencies regarding the emergency and possible relaxation of public protective actions, planning for decontamination actions, establishment of a recovery organization (appointed by RPP-WTP management, development of reporting requirements; and establishment of criteria for resumption of normal operations.

The RPP-WTP will coordinate the accident investigation and ensure that actions are performed in accordance with the RPP-WTP contract and applicable regulations.

9.5.1. Planning and Operations for Hanford Site Recovery

Planning and operations for Hanford Site recovery are described in DOE/RL-94-02. RPP-WTP will support the Hanford Site, as requested, for recovery actions from an emergency at RPP-WTP.

9.5.2. Planning and Operations for Offsite Recovery

The states of Washington and Oregon are responsible for determining when the relaxation of protective measures can begin, and will make offsite reentry and recovery decisions. The states will coordinate recovery activities with the affected counties, who will coordinate local public health actions and disaster assistance. The states will also coordinate recovery actions with the Hanford Site.

A major event at RPP-WTP could involve the implementation of the Federal Radiological Emergency Response Plan and the Federal Response Plan. Implementation of these plans would activate several Federal agencies including the Federal Emergency Management Agency (FEMA), the EPA, Department of Agriculture, and other support agencies (including DOE) to support state and local relief and recovery efforts. Overall coordination of activities under these plans is the responsibility of FEMA.

9.5.3. Incompatible Waste [G-4e(1), G-4e(2)]

After an emergency, the RPP-WTP Recovery Manager and staff will provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at RPP-WTP. The RPP-WTP Recovery Manager and staff will further ensure that no waste that might be incompatible with the released material is treated, stored, and/or disposed of until cleanup is completed. These tasks will be implemented after the development of a detailed recovery plan, as stated in section 9.5 above.

Trained RPP-WTP personnel will perform cleanup activities. In order to meet 29 CFR 1910.120(q)(11) criteria, personnel conducting cleanup will have completed training requirements of 29 CFR 1910.38(a), 29 CFR 1910.134, 29 CFR 1910.1200, and other appropriate safety and health training made necessary by the tasks that they are expected to perform (for example, personnel protective equipment, decontamination procedures). In addition, all equipment to be used in the performance of the clean-up work will be in serviceable condition and will have been inspected prior to use.

Activities may include, but are not limited to,

- Neutralization of corrosive spills
- Chemical treatment of reactive materials to reduce hazards
- Overpacking or transfer of contents from leaking containers
- Use of sorbents to contain and/or absorb leaking liquids for containerization and disposal
- Decontamination of solid surfaces impacted by released material; for example, intact containers, equipment, floors, containment systems
- Disposal of contaminated porous materials that cannot be decontaminated and any contaminated soil
- Containerization and sampling of recovered materials for classification and determination of proper disposal technique
- Follow up sampling of decontaminated surfaces to determine adequacy of cleanup techniques, as appropriate

Waste from cleanup activities will be designated and managed as newly generated waste. Field checks for compatibility before storage will be performed, as necessary, to ensure that incompatible wastes are not placed in the same container, and containers of waste are placed in storage areas appropriate for the compatibility class.

If it is determined that incompatibility of waste was a factor in the incident, the BED and/or RPP-WTP Recovery Manager and staff ensure that the cause is corrected. Examples would be modification of an incompatibility chart or increased scrutiny of waste from a generating unit, when incorrectly designated waste caused or contributed to an incident.

9.5.4. Facility Configuration [G-4e(3), G-4e(4)]

Facility configuration is an important part of the recovery planning to ensure the safety of responders and personnel after emergency termination. All areas of RPP-WTP affected by the emergency will be assessed and controlled to ensure uninhabitable areas are not left uncontrolled where personnel could enter. The recovery plan and restart plan will specifically address any changes in the RPP-WTP configuration (including but not limited to: container storage areas, tank systems, miscellaneous thermal treatment units, and containment building units) as a result of the event or emergency.

10. Public Information

10.1. Purpose

Public information is an integral part of the emergency management program at RPP-WTP so that accurate, candid, and timely information is provided.

10.2. Scope

RPP-WTP has a public information program (TBD #CP07-009), including methods and procedures, to provide for the:

- Education of the public and employees on what to do in the event of an emergency
- Dissemination of accurate, timely information during any level of emergency
- Dissemination of information to help the public and employees recover after an emergency

Coordination with offsite agencies that have the responsibility to provide emergency warning, instructions, and information to the public is key to the success of the public information program. Interfaces and assistance provided to offsite agencies related to public information are documented in MOUs with DOE contained in Appendix B of DOE/RL-94-02, Hanford Emergency Plan. RPP-WTP will work with DOE to develop specific agreements on providing public information.

10.3. Emergency Public Information Program

RPP-WTP will participate in the Emergency Public Information Program as described in DOE/RL-94-02.

10.4. Emergency Public Information Organization

The Emergency Public Information organization is activated as described in DOE/RL-94-02. The Emergency Public Information organization for RPP-WTP emergencies, is made up of RPP-WTP and DOE personnel. Personnel assignments correspond as closely as possible to normal duties. Two components within the DOE Hanford EOC have responsibilities for emergency public information: the Policy team and the Joint Information Center.

10.4.1. Policy Team

The Policy Team has overall responsibility for emergency public information as described in DOE/RL-94-02. RPP-WTP provides a Public Information Director for RPP-WTP emergencies.

Duties and responsibilities of RPP-WTP personnel in the Policy Team are specified in RPP-WTP emergency plan implementing procedures.

10.4.2. Joint Information Center

Public information activities at the Hanford Site are coordinated with offsite agencies through a JIC as described in DOE/RL-94-02. RPP-WTP will utilize existing JIC facilities through the Hanford EOC. JIC staffing is identified for RPP-WTP emergencies in RPP-WTP emergency plan implementing procedures.

10.4.2.1. Information Release

Information is released in a variety of ways from a number of official sources. The emergency public information program at the Hanford Site is designed with the JIC as the single point from which emergency information is released as described in DOE/RL-94-02.

In addition to RPP-WTP, DOE and Hanford Site contractors, the states of Washington and Oregon, and the counties within the plume EPZs of the Hanford Site have included JIC participation in their emergency plans. Additionally, local authorities utilize the JIC as their means to provide information to the media and the public. State agencies may release information directly from the state EOC.

10.4.2.2. News Releases

News releases will be managed through the JIC as described in DOE/RL-94-02.

10.4.2.3. News Conferences

News conferences will be conducted from the JIC as described in DOE/RL-94-02.

10.4.2.4. Rumor Control

Rumor control will be managed as described in DOE/RL-94-02.

10.4.2.5. Telephone Teams

RPP-WTP will provide support for telephone teams to answer questions from the public and media as described in DOE/RL-94-02.

10.4.2.6. Media Tours

Media tours of the affected area may be provided, if appropriate.

10.4.2.7. Information to Hanford Site Personnel

Information to Hanford Site personnel will be provided as described in DOE/RL-94-02.

10.4.2.8. Staffing and Responsibilities

RPP-WTP shall provide staff to support the JIC. RPP-WTP staff identified to support the JIC shall receive general training on JIC operations and on their specific tasks.

1.5. Public Education

RPP-WTP will work with DOE to assist the jurisdictions within Hanford Site EPZs in the development and implementation of programs to educate their residents on the actions to take in the event of an emergency at RPP-WTP.

RPP-WTP participates in public meetings sponsored by DOE, state, tribal, or local emergency management officials to make the public aware of RPP-WTP activities in the region, the potential risk from these activities, and the RPP-WTP emergency preparedness program. RPP-WTP coordinates with

DOE to provide information on the RPP-WTP emergency management program to the media and offsite agencies.

RPP-WTP provides information to the public and the media for each major exercise in order to educate the local community on RPP-WTP activities to test the emergency preparedness program. This information will be coordinated with local emergency management officials.

10.5.1. Plume Emergency Planning Zone Public Education

The state of Washington and Benton, Franklin, and Grant Counties have instituted a public education program to ensure that the members of the public within a plume EPZ of the Hanford Site are aware of the proper actions to take following notification of an emergency. The counties' programs have been identified in their respective emergency plans. These plans, developed cooperatively with DOE and Energy Northwest, include:

- Annual distribution of an emergency information calendar for residents within the plume EPZs
- Distribution of a brochure for farmers and growers
- Distribution of information for special audiences such as boaters or Spanish-speaking residents
- Periodic public meetings
- Annual surveys to determine the effectiveness of these programs

Information provided to residents includes:

- A description of the hazards
- How they will be notified
- Protective actions they may be asked to take (i.e., sheltering or evacuation)
- Evacuation routes and where to go if they are asked to evacuate
- Special provisions for schools or other special facilities
- How those with special needs can get help

RPP-WTP will work with DOE, Energy Northwest, and the counties to ensure that RPP-WTP specific impacts and information are included in these activities.

10.5.2. Ingestion Emergency Planning Zone Public Education

The states of Washington and Oregon, affected tribal organizations, and counties are responsible to provide education to residents within the ingestion EPZ. Information may include:

- A description of the potential impact of an emergency on residents and the agriculture community
- Preventive measures to help avoid or reduce the impact if a release occurs
- Actions to take during and after a release

Information may be provided through the dissemination of printed materials to target audiences, conducting public meetings and providing information to the media. Once this information has been determined for RPP-WTP, it will be provided to the states for inclusion in this process (TBD #CP07-009).

11. Emergency Facilities and Equipment

11.1. Purpose

This section identifies and describes the emergency facilities and equipment used and maintained at the RPP-WTP and by the Hanford Site for response to an abnormal or emergency events.

11.2. Scope

The provision of facilities and equipment adequate to support emergency response, including the capability to notify employees of an emergency to facilitate the safe evacuation of employees from the work place, immediate work area, or both are addressed as scope for this section.

11.3. Emergency Facilities

This section contains a description of the RPP-WTP and Hanford Site facilities that have been equipped for emergency control, operations, and coordination.

11.3.1. Hanford Emergency Operations Center

The Hanford EOC is described in DOE/RL-94-02

11.3.2. Hanford Patrol Operations Center

The POC is maintained as described in DOE/RL-94-02.

11.3.3. Occurrence Notification Center

The ONC is maintained as described in DOE/RL-94-02.

11.3.4. Emergency Medical Facilities

Capabilities for medical aid, triage, and personnel decontamination will be available at RPP-WTP or through a response by the Hanford Fire Department. Emergency medical support is described further in section 8.

11.3.4.1. RPP-WTP Emergency Medical Facilities

Emergency medical facilities at the RPP-WTP will include the following:

RPP-WTP Health Care Center (HCC): (TBD #CP07-010) The HCC will contain sufficient medical supplies to treat patients with occupational illnesses or injuries who do not require hospitalization. An ambulance service will be provided by the Hanford Fire Department

RPP-WTP Personnel Decontamination Facilities: (TBD #CP07-011).

Emergency decontamination facility: The EDF will be located north of Kadlec Medical Center in Richland, Washington. This will be a dedicated, hardened facility designed to accommodate non-serious or non-life-threatening radiologically contaminated injuries.

11.3.4.2. Offsite Emergency Medical Facilities

Agreements are in place between DOE and local hospitals for backup medical treatment and are contained in DOE/RL-94-02, Appendix B. Through agreements with DOE, RPP-WTP will use these existing MOUs.

11.3.5. State and County Emergency Operations Centers

The Benton County EOC is located at 651 Truman Avenue, Richland, Washington.

The Franklin County EOC is located at 502 Boeing Street, Pasco, Washington.

The Grant County EOC is located at 6500 32nd Avenue NE, Moses Lake, Washington.

The Washington State EOC is located in the office of the Washington State Emergency Management Division (Building 20) at Camp Murray in Tacoma, Washington.

The Oregon State EOC is in the office of the Oregon Emergency Management Division, located at 595 Cottage Street NE, Salem, Oregon.

11.3.6. RPP-WTP Emergency Facilities

RPP-WTP will have a dedicated Incident Command Post, situated adjacent to the main control room in the Pretreatment Plant. Communication equipment is described in section 5.8.2. An alternative ICP is (TBD #CP07-012).

11.4. RPP-WTP Emergency Equipment (G-5)

An emergency equipment list will be developed and maintained in an emergency plan implementing procedure. Equipment intended for emergency response will be listed, capabilities described, and the location(s) identified. Emergency equipment at RPP-WTP may include fire extinguishing systems, spill control equipment, monitoring equipment, communications equipment (including alarms), and decontamination equipment. The following subsection describes the emergency equipment that may be used by the RPP-WTP.

Adequate personal protective equipment and other equipment and supplies will be available and operable to meet the needs determined by the results of the emergency preparedness hazards assessment and for emergency response personnel to carry out their responsibilities as applicable.

Emergency and backup equipment (including monitoring devices) will be located in readily accessible areas at the RPP-WTP, separate from the scene of the potential accident for which it is intended. Equipment will be available, as appropriate, to meet needs arising out of potential, potential evens and emergencies, as analyzed in the Emergency Preparedness Hazards Assessment.

As applicable, the BED or the RPP-WTP Recovery Manager, or both, will ensure that all equipment is cleaned and fit for its intended use before operations are resumed. This may include ensuring that depleted stocks of neutralizing and absorbing materials are replenished, self-contained breathing apparatus are cleaned and refilled, fire extinguishers are recharged or replaced, and protective clothing is cleaned or disposed of and restocked.

11.4.1.1. Fire Control Equipment

The RPP-WTP buildings will be equipped with fire control equipment, such as automatic fire-suppression (sprinkler) systems and portable fire extinguishers, as appropriate, in accordance with NFPA safety codes. Portable fire extinguishers will comply with the National Fire Code standards and will be inspected monthly, as described in Chapter 6 of the RPP-WTP *Dangerous Waste Permit Application*, (DWPA) with inspections recorded on tags attached to each extinguisher. Emergency Wash Equipment RPP-WTP buildings that contain hazardous materials will have safety showers and eyewash stations, located as necessary, in accordance with applicable regulations. Drainage from these stations will be contained. In addition to these stations, portable eyewash equipment will be maintained at protective storage areas as necessary. The eyewash and shower stations will be inspected regularly as described in Chapter 6 of the DWPA.

11.4.1.2. Assessment Equipment

Emergency equipment will be available, as appropriate, to allow an early and reliable determination of the seriousness of an event or emergency. The equipment for both emergency and continuing assessment of the buildings and environment at the RPP-WTP will be provided at a later date, but may consist of dosimeters, radiological instrumentation, and effluent and environmental monitoring equipment.

Arrangements for aerial surveillance and monitoring through UDAC are in place with the Aerial Measuring System (DOE Nevada Operations Office) through DOE as described in DOE/RL-94-02.

11.4.1.3. Emergency Instrumentation

Under emergency conditions, many needed supplies and equipment will be drawn from the instrument and equipment pool used for normal operations, both from the RPP-WTP and other Hanford Site facilities. This pooling of resources will ensure that multiple sources of supplies are available.

11.4.1.4. Spill Control and Contamination Supplies

Spill control and contamination supplies will be located in RPP-WTP buildings and areas, as necessary. Supplies may include sorbent materials for organic or inorganic materials; diatomaceous earth for liquid waste spills; neutralizing sorbents for response to acid or caustic spills; containers and salvage containers (for example, overpacks); and brooms, shovels, and miscellaneous spill response supplies.

11.4.2. Emergency Protective Equipment

Protective clothing and respiratory protective equipment will be maintained at RPP-WTP as applicable for use during both routine and emergency operations.

11.5. Hanford Site Emergency Resources

11.5.1. Emergency Equipment

RPP-WTP may request emergency equipment from other Hanford Site contractors.

Equipment that could be used in an emergency response to support RPP-WTP would be obtained through processes defined in the Hanford EOC procedures.

As applicable, the RPP-WTP Recovery Manager and staff will ensure that all equipment is cleaned and fit for its intended use before operations are resumed. This may include actions to ensure that depleted stocks of neutralizing and absorbing materials are replenished, self-contained breathing apparatus is cleaned and refilled, fire extinguishers are recharged or replaced, and protective clothing is cleaned or disposed of and restocked.

11.5.2. Hanford Patrol

Hanford Patrol maintains security response equipment, including transportation, weaponry, protective equipment, and communication.

11.5.3. Hanford Fire Department

The Hanford Fire Department maintains fire-fighting, hazardous material response, and rescue equipment. The Hanford Fire Department also operates the site ambulance service from the various area fire stations.

A description of equipment for hazardous material responses available through the hazardous materials response team is delineated in DOE/RL-94-02, Appendix C.

11.6. Maintenance and Testing of Alarm and Communication Systems

The RPP-WTP management is responsible for ensuring that the responsible maintenance organizations schedule and perform preventive maintenance on facility emergency sirens, alarms, and other emergency communication equipment, in accordance with the established preventative maintenance procedures.

The RPP-WTP sirens and alarms cannot be heard offsite, and will be tested monthly in coordination with the Hanford Site testing schedule.

The RPP-WTP management will ensure that, in the case of non-routine siren and alarm tests that may be heard by other Hanford Site employees, the DOE-RL Office of Security and Emergency Services will be kept informed. Additionally, other means of communications to the RPP-WTP may be used, such as announcements over the crash alarm telephone system, public address system, and e-mail. Hanford site-wide information sources, such as the POC and Hanford telephone operator, will also be notified of any audible facility or area siren or alarm testing.

11.7. Inventory of Emergency Equipment

The RPP-WTP facility emergency equipment will be inventoried periodically in accordance with RPP-WTP inventory control and documentation procedures (TBD #CP07-013), to ensure its availability in the event of an emergency.

Additionally, records of these inventories will be maintained in accordance with inventory control and documentation procedures. Emergency equipment added to, deleted from or otherwise found to require correction shall be immediately corrected. Changes to equipment inventories will be immediately communicated to the RPP-WTP emergency management program administrator for revision of this plan.

Figure 11-1. RPP-WTP Emergency Facilities

(TBD #CP07-014)

12. Training

12.1. Purpose

In addition to training that RPP-WTP personnel receive on their day-to-day functions, a coordinated program of training and drills for developing and maintaining specific emergency response capabilities will be an integral part of the RPP-WTP emergency management program.

12.2. Scope

The Hanford Site has existing training programs that will be used, where possible, by RPP-WTP. In addition, training will address specific hazards and emergency response specific to RPP-WTP. This specific training will be based on information drawn from the hazards analysis, and training requirements will be specified in emergency plan implementing procedures.

12.3. Training Requirements

The BED will be suitably qualified and experienced to perform the required duties. Formal job descriptions and qualifications will be established for the BED and other ERO staff. At a minimum, these criteria address specifications for education, related experience, familiarity with the RPP-WTP procedures, and satisfactory performance in the position during a drill or exercise. The BED and alternates will attend a training course, "Building Emergency Director Training." The RPP-WTP training program has control and administrative processes that ensure each member of the ERO meets qualifications, experience, and training requirements. The adequacy of the BED, the FERO, emergency plan implementing procedures, and functional capabilities, will be evaluated during emergency drills and exercises. Refer to the River Protection Project – Waste Treatment Plant dangerous Waste Training Plan, Appendix B for specific training courses required for the BED.

12.4. Offsite Personnel Training

Emergency-related information, transportation information, and training on RPP-WTP specific conditions and hazards will made available to offsite personnel who may be required to respond to an emergency at the RPP-WTP. The training will be provided in support of and in conjunction with the DOE, counties, tribes, and states at their request. Information on hazards and emergency response procedures also will be provided to the media and the public as appropriate.

13. Exercises and Drills

13.1. Purpose

This section describes the RPP-WTP emergency management exercise and drill programs, their requirements, and coordination with the Hanford Site.

13.2. Scope

This section applies to those RPP-WTP organizations and individuals responsible for developing, conducting, and critiquing exercises and drills, in coordination with the Hanford Site and offsite agencies, as they relate to emergency preparedness exercises.

13.3. Exercise Program

Exercises provide the opportunity for RPP-WTP personnel to respond to a simulated emergency and demonstrate and validate general employee and RPP-WTP facility-specific training.

The RPP-WTP will establish and maintain a formal exercise program to validate all elements of the emergency management program. The exercise program will be documented in an emergency plan implementing procedure. Each exercise will have specific objectives and will be documented (for example, by scenario packages that include objectives, scope, timelines, injects, controller instructions, and evaluation criteria).

Exercises will be evaluated. A critiquing process, which includes gathering and documenting observations of the participants, will be established. Corrective action items identified as a result of this critique process will be incorporated into the RPP-WTP emergency management program tracking system. The emergency management program administrator will be responsible for maintaining the tracking system, to ensure all actions are tracked to closure.

The RPP-WTP emergency management exercise program will include:

- Scheduling
- Development
- Quality control
- Critiquing
- Reports
- Coordination with the Hanford Site exercise program
- Action tracking

Exercises will be part of the annual RPP-WTP work plan to ensure responders are prepared. Organizations within RPP-WTP may be required to:

- Support the development, conduct, and evaluation of exercises within their geographic or functional area

- Provide members to participate in the scenario development process when their area or function is involved

- Provide controllers and or evaluators to conduct and evaluate exercises

- Ensure appropriate staff participation in exercises and associated training

RPP-WTP staff that are ERO members assigned duties in the Hanford EOC will participate in exercises annually, as designated in the exercise schedule. The exercises will be designed to test and demonstrate the site's integrated emergency response capability.

Adherence to operational emergency notification and reporting requirements should be demonstrated in all emergency management exercises.

13.4. Exercise Definitions

The RPP-WTP will maintain an exercise program with two types of exercises: limited, and field. Each of these programs is defined in the following subsections.

13.4.1. Limited Exercise

A limited exercise may separately test and validate the responsibilities of the incident command organization, those staff members responding to the Hanford EOC, or portions of each together, or all in coordination with Hanford Site response organizations such as:

- POC
- ONC
- Hanford EOC staff, with no offsite involvement

Communication links may include the:

- POC
- ONC
- ICP to the Hanford EOC

13.4.2. Field Exercise

A field exercise will test and validate the responsibilities of all aspects of the RPP-WTP ERO, facility personnel, and its coordination with the Hanford Site ERO. Additionally, offsite involvement may be included.

13.5. Exercise Development and Conduct

13.5.1. Development

Exercises will be of sufficient scope and frequency to ensure the development and maintenance of an adequate response capability.

The RPP-WTP emergency management program administrator will be responsible for:

- Developing and maintaining procedures to implement the requirements of the exercise program

- Developing, maintaining, and communicating a five-year and annual schedule of exercises

- Developing and maintaining an exercise objectives matrix, that identifies the elements to be tested during exercises, and determines appropriate objectives based on approved procedures to be tested and verified

- Providing controller and evaluator training to ensure trained controllers and evaluators are available for exercises

Each major exercise "draft" package will be submitted to a senior BNFL Inc. operations manager or delegate for review, comment, and approval.

13.5.2. Conduct

Conduct of the exercise will be an important aspect of an overall exercise, to ensure that objectives can be evaluated and that the response is as real as possible. The RPP-WTP emergency management program administrator will develop and maintain an exercise procedure that specifies requirements for conducting an exercise. The following information will be included in exercise procedures, which will define the conduct of the exercise process, and required for conducting exercises.

- Exercises will be conducted by a trained and qualified organization
- The conduct of exercises will be communicated to and coordinated with the Hanford Site
- Conduct of exercises will be in accordance with approved exercise procedures
- Conduct of exercises will be include approved safety requirements and limitations

13.6. Exercise Evaluation and Corrective Action

The RPP-WTP emergency management program administrator will ensure that an evaluation is conducted for each exercise.

The exercise evaluation criteria will be based on this plan, and on emergency plan implementing procedures. An overall graded evaluation of the exercise, will be determined by those evaluating the exercise.

Exercise deficiencies, weaknesses, and findings will be tracked on the emergency management tracking system. The emergency management program administrator will be responsible for ensuring that these items are tracked to completion, in addition to tracking improvement items considered worthy of action but not deemed a deficiency or weakness. The emergency management administrator will recommend corrective actions to the appropriate organization for implementation as required.

Lessons learned from exercises will be issued either by the emergency management organization or the RPP-WTP lessons learned coordinator.

13.7. Offsite Coordination

Offsite agencies may be invited to participate in the preparatory tabletop and field exercises. Participation by offsite agencies will depend on the scenario and the agencies' desired level of participation.

Coordination of offsite participation will be established initially through a local emergency planning committee meeting and/or through the DOE. Further coordination will be accomplished through a scenario review group, which will meet prior to an exercise to develop the exercise scenario package.

The exercise needs of offsite agencies will be discussed with the scenario review group as applicable, and will be included in the scenario, to the extent possible, without compromising the exercise requirements.

13.8. Drill Program

Drills will provide supervised hands-on training and application sessions for members of the RPP-WTP FERO. These sessions will provide an opportunity to demonstrate and maintain individual and organizational proficiency. In order to ensure response proficiency is maintained, drills will be assessed to identify and document the training needs and areas of less than adequate performance.

13.8.1. Drill Definitions

Emergency preparedness drills conducted at the RPP-WTP will include all elements of the emergency preparedness program. A series of drills will be conducted that will include all program elements; however, a given drill may be limited in scope to include only those specific elements that pertain to the scope of that drill. Operations drills are not addressed in this plan, but may also include elements of emergency response.

13.8.1.1. Emergency Preparedness Drill

An emergency preparedness drill will involve designated facility emergency response personnel and the Hanford incident command system. Such drills could include tabletop drills, walk-through training drills (controller interaction with players as coaches or instructors), and full facility participation drills. The type of drill to be conducted will be clearly communicated to all participants, observers, controllers, and evaluators.

Emergency preparedness drills will require the use of the appropriate emergency plan implementing procedures and, at a minimum, should demonstrate:

- Implementation and coordination of facility protective actions such as take cover or evacuation
- Event recognition, and classification
- Event mitigation
- Emergency and environmental notifications and communications
- Interface with incident command system functions and other affected Hanford resources

13.8.1.2. Protective Action Drill

A protective action drill will involve all RPP-WTP personnel, and may be conducted separately, or included in emergency preparedness or operations drills. Personnel accountability should be performed, when appropriate, during protective action drills.

13.8.2. Drill Development and Conduct

Drills should be of sufficient scope and frequency to ensure an adequate and trained RPP-WTP ERO.

In addition, drills should be designed to demonstrate proficiency for as many of the following items, as appropriate, for the facility being drilled:

- Notification

- Response to fire and medical emergencies
- Response to spills and releases of hazardous materials, including detecting and monitoring such releases
- Personnel accountability
- Protective actions
- Event classification
- Activation of the initial ICP
- Personnel decontamination

RPP-WTP will identify drill coordinators who have successfully completed drill coordinator training or demonstrated equivalent training or experience.

The designated emergency management program administrator will be responsible for the following:

- Designing and executing the RPP-WTP facility emergency management drill program
- Approving the drill package, signing the drill report and forwarding the report to the RPP-WTP operations manager.
- Entering drill findings into the appropriate commitment tracking system
- Ensuring the adequacy of the drill package, including the scenario, and selecting and training the drill control organization.

Drills will be conducted by a qualified, trained, and experienced control organization. Drill controllers will be qualified to control areas of performance assigned and for emergency preparedness and operations drills and will have attended drill controller and evaluator training.

A graded approach to the number, type, and extent of RPP-WTP facility protective action drills will be based on the hazards present in the emergency preparedness hazards assessment. An annual drill schedule will be prepared, and drills will be coordinated to ensure the maximum training value.

Drill packages will contain, as a minimum:

- Scope and limitations
- Simulations
- Scenario narrative
- Technical data (for example, realistic plant conditions and proper source terms)
- Objectives and evaluation criteria
- Drill messages

Emergency preparedness drills will be conducted frequently enough to provide proficiency and complete confidence in response capability. Personnel assigned emergency duties should participate in drills

covering emergency events or hazardous (for example, fire, injury, spill, radiological release, loss of power, and loss of ventilation).

13.8.3. Emergency Preparedness Drill Evaluation

For emergency preparedness and protective action drills, each drill objective will have evaluation criteria. A participant critique will be conducted immediately following the drill to provide preliminary feedback on objectives and to allow participants to conduct a self-assessment. Areas of inadequate response or improvement will also be addressed.

In a separate controller critique, following the participant critique, the controllers will evaluate each objective and the overall drill. The drill coordinator will be responsible for the drill and will receive the report from the lead controller.

14. Program Administration

14.1. Purpose

The program administration will establish and maintain effective organizational management and control of the emergency management program. RPP-WTP management will ensure the preparation and maintenance of plans and procedures necessary to carry out its responsibilities during an emergency and will schedule all activities (i.e., drills, exercises, and assessments).

14.2. Scope

The RPP-WTP management will be responsible for administering the overall emergency management program for RPP-WTP, and will delegate the authority to develop, implement, and maintain the emergency management program to the emergency management program administrator.

14.3. Emergency Management Program Administrator

RPP-WTP will assign an emergency management program administrator to manage all aspects of the emergency management program. The administrator's duties will include, but will not be limited to:

- Maintaining the emergency plan and implementing procedures
- Designating and verifying the training and qualifications of the RPP-WTP ERO members
- Managing the emergency management exercise and drill programs and ensuring, that each RPP-WTP ERO member participates in at least one drill or exercise each year
- Coordinating the reviewing and updating of the emergency preparedness hazards assessment, as required
- Working with operations and engineering to develop valid EALs
- Working with the training department to validate the content of emergency preparedness training courses and the qualifications of emergency preparedness instructors
- Maintaining emergency facilities and equipment
- Participating in local emergency planning committee and Hanford Emergency Preparedness Council meetings
- Working with federal, state, and local emergency management organizations
- Ensuring all regulatory requirements pertaining to the emergency management program are addressed
- Coordinating the emergency management tracking system (tracking actions to completion)
- Incorporating lessons learned from drills, exercises, actual events into the RPP-WTP emergency management program

- Maintaining vital records and emergency records in accordance with BNFL Inc. vital record procedures, as set up in the project document control system.

14.4. Lessons Learned

The RPP-WTP emergency management program includes a system to track and identify correction of findings or lessons learned from training, drills, exercises, and actual responses.

Lessons learned developed by the emergency management program are issued to the RPP-WTP lessons learned coordinator for dissemination.

14.5. Document Control

This plan and emergency plan implementing procedures will be controlled distribution documents. RPP-WTP will use a document control system to ensure that controlled copies are up to date and available at locations where they may be needed in an emergency. The RPP-WTP emergency management program administrator will determine the internal and external controlled copy distribution of the emergency plan and respective implementing procedures.

14.6. Annual Review

This plan and the emergency plan implementing procedures will be reviewed annually by the RPP-WTP and the appropriate response organizations and agencies. The emergency management program administrator will be responsible for coordinating this review and any resulting actions. Revising and updating of this plan or the emergency plan implementing procedures, or both, may be initiated at any time deemed necessary by RPP-WTP, and revisions will be initiated immediately when:

- Applicable regulations are revised
- The emergency plan or procedures fail in an emergency
- The facility changes (for example, design, operation, maintenance, etc.) in a way that materially increases the potential for fires, explosions, or releases of dangerous waste or dangerous waste constituents, or in a way that changes the response necessary in an emergency
- Hazardous inventories change, necessitating different responses.
- The BED changes
- The list of emergency equipment changes

A controlled copy of the approved emergency plan will be submitted to the RU.

14.6.1. Review of Agreements

Agreements established by RPP-WTP will be reviewed annually and revised as necessary. The RPP-WTP emergency management program administrator will maintain documentation of the annual review.

14.6.2. Supporting Documents

RPP-WTP will maintain copies of documents and records that support the emergency management program (i.e., technical data, emergency preparedness hazards assessments, and plans and procedures). Records of training, drills, and exercises will be maintained to document status of the program, provide direction for improvements, and ERO participation in drills and exercises.

14.6.3. Management Assessments

RPP-WTP will have an independent management assessment program that will include emergency preparedness. The RPP-WTP emergency management program administrator will ensure that issues identified in management assessments are placed into the appropriate commitment tracking system and tracked until closure.

14.7. Vital Records

A program will be established to ensure that vital records, regardless of media, which are essential to continued functioning or reconstruction of an organization during and after an emergency, are maintained and available and comply with the overall BNFL Inc. vital records program, in accordance with 36 CFR 1236 (TBD #CP07-015).

The vital records program will be administered by RPP-WTP and will be reviewed annually for effectiveness.

14.8. Emergency Records

Emergency records will be managed in accordance with DOE/RL-94-02. RPP-WTP emergency procedures provide for documentation of emergency records that contain information for review and reconstruction of major communications and actions taken during an emergency. These records include records and documentation produced by the FERO. The RPP-WTP emergency management program administrator will ensure that emergency records are maintained in the project document control system.

In addition, provisions will be in place for the control, monitoring, and maintenance of records of personnel exposures to hazardous materials in response to emergency conditions (TBD #CP07-016). RPP-WTP exposure records will be stored in accordance with document control records retention requirements.

14.9. Emergency Plan Locations

RPP-WTP will ensure that controlled copies of this plan are maintained at the following locations:

- RU program office
- RPP-WTP emergency management program administrator office and other facility locations as specified
- RPP-WTP BED office
- Hanford Fire Department

- DOE Hanford Emergency Operations Center (primary and alternate)

- POC

Copies of the plan are provided to the following offsite agencies (according to their request) to meet the WAC 173-303-350(4) requirement:

- Kennewick Police Department
- West Richland Police Department
- Washington State Patrol
- Pasco Fire Department
- Richland Fire Department
- City of Kennewick
- Kadlec Medical Center
- Our Lady of Lourdes Health Center
- Benton County Emergency Management Center
- Franklin County Emergency Management Center
- Grant County Emergency Management Center

References

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DOE/RL. 1992. *US Department of Energy Radiological Assistance Program Plan and Procedure Region 8*, DOE/RL-92-49. US Department of Energy, Richland Operations Office, Richland, Washington, USA.

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FDH. 1997. *Hanford Fire Department Emergency Medical Services Program Plan*, HNF-EP-0575. Fluor Daniel Hanford Company, Richland, Washington, USA.

FEMA. 1996. *Federal Radiological Emergency Response Plan*. Federal Emergency Management Agency, Washington, D.C., USA.

Resource Conservation and Recovery Act of 1976, 42 USC 6901 et seq.

Washington State Hanford Emergency Response Plan, Washington State Department of Community, Trade, and Economic Development, Olympia, Washington, USA.

Appendix A
Completion Schedule

Appendix A. Completion Schedule

See supplement 8, Completion Schedule, of the RPP-WTP DWPA for details on planned completion items for this Emergency Management Plan.

Appendix B
RPP-WTP Regulatory Crosswalk

Table B-1. Hanford Site Documentation Crosswalk Matrix

Hanford Site documentation of the applicable regulations of WAC 173-303 are defined in DOE/RL-94-02, Appendix A.	
RPP-WTP Documentation Crosswalk Matrix for Unit Specific Items (Ecology Checklist)	
WAC 173-303 Unit Specific Requirements	**Emergency Management Plan Reference**
G-1 General Information Provide the facility name and location, operator name, site plan, and overview description of facility operations.	1.5.2, 1.5.2.1
G-2 Emergency Coordinator	
a Provide names, titles, addresses, office and home phone numbers, and duties of primary and alternate emergency coordinators. Provide a statement authorizing the coordinator to commit the necessary resources to carry out the plan; the statement must be signed by someone with the authority to commit the facility's resources; and	2.3.2
b Describe the minimum qualifications (training and experience) that will be required of people hired to fill positions designated with the duties of the emergency coordinator and alternates. The minimum qualifications must show that employees will be qualified to act as emergency coordinator.	12.3 references appendix 8-A of the DWPA
G-3 Circumstances Prompting Implementation Describe when the contingency plan will be implemented to respond to emergency circumstances, including damaged shipments. An emergency circumstance includes a fire, explosion, or unplanned sudden or nonsudden release of dangerous waste or dangerous waste constituents to air, soil, surface water, or ground water. Make the descriptions specific to the facility and the types of waste managed there.	4.3.2
G-4 Describe the actions and emergency procedures facility staff must implement to lessen the potential impact on human health and the environment in the event:	
a Of an emergency circumstance; or	a. 2.3.2 & 7.6
b That a shipment is denied receipt but cannot leave the facility because transport would present a hazard to human health or the environment due to: 1) the extent of damage to the containers; or 2) the condition of the waste.	b. 4.3.2

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WAC 173-303 Unit Specific Requirements	**Emergency Management Plan Reference**
G-4a Notifications Describe the procedures and methods for immediately notifying the following an imminent or actual emergency:	
1) Facility personnel; and	1) 7.6
2) Appropriate state and/or local agencies if their help is needed. Briefly describe the circumstances requiring help by other agencies along with which agency(ies) would be called upon to provide the help.	2) 2.3, 2.3.1
Note that the facility must also notify under WAC 173-303-145.	Note: 5.7.1
G-4b Identification of Dangerous Materials: Describe procedures and equipment for identifying the character, exact source, amount, and areal extent of any release materials when there has been a release to the environment, a fire, or an explosion. Include a generic sampling and analysis plan outlining the basic steps which will be taken to quantify the extent of contamination.	6.3
G-4c Hazard Assessment and Report:	
1) Describe the criteria used to assess the possible hazards to human health and the environment that may result from the fire, release, spill, or explosion, considering direct, indirect, immediate, and long-term effects. Also describe the criteria used to assess the need for evacuation and notification of authorities; and	1) 4.5.2, 6.3
2) Identify the state and local authorities to be notified in the event a release, fire, or explosion has occurred which could threaten human health or the environment; this list should include the government official designated as the on-scene coordinator for the area or the National Response Center. This list may be similar to the one prepared for G-4a.	2) 5.6

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WAC 173-303 Unit Specific Requirements	**Emergency Management Plan Reference**
G-4d Prevention of Recurrence or Spread of Fires, Explosions, or Releases:	
1) Describe the necessary steps that will be taken to ensure that fires, explosions, or releases do not occur, reoccur, or spread to other dangerous waste at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released waste (including waste-contaminated soil or surface water), removing waste from tanks, and removing or isolating containers. Include clean-up levels and procedures for cleaning up waste-contaminated soil and other media or debris; and	1) 2.3.2
2) Describe procedures for ensuring that, if the facility stops operations in response to an emergency, the emergency coordinator will monitor for leaks; pressure buildup; gas generation; or ruptures in valves, pipes, or other equipment, where ever this is appropriate.	2) 2.3.2
G-4e Post-Emergency Actions:	
Describe:	
1) Procedures to ensure that, immediately after the emergency, any material that results from a release, fire, or explosion at the facility will be properly treated, stored, or disposed of;	1) 2.3.2, 9.5.3
2) Provisions to prevent incompatible waste from being treated, stored, or located in the affected areas until clean-up procedures are completed;	2) 2.3.2, 9.5.3
3) Procedures and provisions to ensure tank systems are expeditiously repaired or closed;	3) 9.5.4
4) Procedures and provisions to ensure container storage areas are expeditiously repaired or closed;	4) 9.5.4
5) Procedures to ensure that all emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed; and	5) 2.3.2
6) Procedures to notify Ecology and the appropriate local authorities (list the authorities) that the facility has completed clean-up procedures and that emergency equipment is clean and ready for its intended use.	6) 5.7.3
G-5 Emergency Equipment:	
List and describe the emergency equipment and where it is kept. Emergency equipment includes, and is not limited to: fire extinguishing systems, spill control equipment, monitoring equipment (such as meters that measure combustible gas, oxygen, and/or levels of specific toxic gases that might be present at the facility), communications and alarm systems, and decontamination equipment.	11.4

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RPP-WTP Documentation Crosswalk Matrix for Unit Specific Items (Ecology Checklist)	
WAC 173-303 Unit Specific Requirements	**Emergency Management Plan Reference**
G-6 Coordination Agreements: a Describe the coordination agreements with local police and fire departments, hospitals, contractors, equipment suppliers, and state and local emergency response teams, including designation of a primary emergency authority if more than one party might respond and the agreements for other entities to provide support to the primary authority. List all the entities with which the facility has made arrangements; b Describe arrangements: 1) To familiarize police, fire departments, and emergency response teams with the layout of the facility, properties of dangerous waste handled at the facility and associated hazards, places where facility personnel would normally be working, entrances to and roads inside the facility, and possible evacuation routes; and 2) To familiarize local hospitals with the properties of dangerous wastes handled at the facility and the types of injuries or illnesses which could result form emergencies; and c If state or local authorities decline to enter into arrangements for coordinator or familiarization, provide documentation of the refusal.	2.3.3, 2.3.4, 8.0
G-7 Evacuation Plan Describe the planned and alternate evacuation routes and the signal(s) that will be used to begin evacuations. Include routes and signals for both onsite and offsite. The routes must take wind direction into account.	7.12.2
G-8 Required Reports, Recordkeeping, and Certifications G-8a General Requirements Describe the provisions for noting in the operating record the time, date, and details of any incident that requires implementing the Contingency Plan. Describe the procedures for submitting a report on the emergency incident within 15 days of its occurrence. Demonstrate that the report will include the elements required by 360(2)(k).	- 2.3.2 - 5.7.1 - 5.7.1

Table B-1. Hanford Site Documentation Crosswalk Matrix

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RPP-WTP Documentation Crosswalk Matrix for Unit Specific Items (Ecology Checklist)	
WAC 173-303 Unit Specific Requirements	**Emergency Management Plan Reference**
G-8b Requirements for Tank Systems:	
Describe:	
1) Procedures for reporting to Ecology any release to the environment within 24 hours of its detection;	1) 5.7
2) Procedures for submitting a written report within 30 days of a release to the environment. Demonstrate that the report will include the elements required by 640(7)(d)(iii); and	2) 5.7.2
3) Provisions for certifying that a major repair of a tank system has been completed and the tank system has been placed back into service.	3) 5.7.3

Appendix C
Description of Emergency Response Procedures

Appendix C
Description of Emergency Response Procedures

This section provides an overview of how the RPP-WTP responds to events. It covers the actions to be taken for an event or emergency by the event discoverer and the RPP-WTP facility emergency response organization (FERO).

1. Spill

1.1. General Personnel Response.

The discoverer of an event initiates the initial response:

- **S**top – Employee is to stop activities and place equipment in a safe configuration if safe to do so.
- **W**arn – Warn others in the immediate area of the hazard(s) and also notify 911 (for immediate emergency response), the control room, and the BED.
- **I**solate – Isolate the area, so others do not wander into an unknown hazard.
- **M**inimize – Minimize exposure by moving upwind from the incident.

For some events, specific response actions to mitigate the event by the discoverer and/or facility staff may be appropriate. In such cases, actions may include shutting down systems, isolating materials, or performing other facility specific response actions, when appropriate.

1.2. ERO Response

- As applicable, ensure notification to 911 or the HFD
- Follow emergency plan implementing procedures as applicable
- Activate and initial Incident Command Post in a safe location (primary or alternate)
- Conduct personnel accountability
- Identify exact location and source of spill
- Identify hazards
- Conduct a turnover to the Incident Commander

2. Release

2.1. General Personnel Response

The discoverer of an event initiates the initial response:

- **S**top – Employee is to stop activities and place equipment in a safe configuration if safe to do so.
- **W**arn – Warn others in the immediate area of the hazard(s) and also notify 911 (for immediate emergency response), the control room, and the BED.

- **I**solate – Isolate the area, so others do not wander into an unknown hazard.
- **M**inimize – Minimize exposure by moving upwind from the incident.

For some events, specific response actions to mitigate the event by the discoverer and/or facility staff may be appropriate. In such cases, actions may include shutting down systems, isolating materials, or performing other facility specific response actions, when appropriate.

2.2. ERO Response

- As applicable ensure notification to 911 or the HFD for additional protective actions and emergency response
- Follow emergency plan implementing procedures as applicable
- Activate and initial Incident Command Post in a safe location (primary or alternate)
- Conduct personnel accountability
- Identify exact location and source of release
- Identify hazards
- Conduct a turnover to the Incident Commander

3. Fire

- Fire alarms will be initiated either automatically by smoke/heat detectors or RPP-WTP personnel.
- Activation of alarm will activate sprinklers where required by code.
- The alarm will alert HFD, Hanford POC and control room personnel in the RPP-WTP main control room.
- The fire protection system panel will also identify area of building where the event is located.

3.1. General Personnel Response

- On detecting a fire, personnel will activate the nearest fire alarm and evacuate the building.
- 911, the control room, and the BED will be notified.
- On hearing a fire alarm, personnel will immediately evacuate the building to the pre-defined staging area.
- Accountability will be conducted.

3.2. Emergency Response Organization Response

- Confirm that HFD have been notified and are responding
- Follow emergency plan implementing procedures as applicable
- Follow emergency plan implementing procedures as applicable
- Activate and initial Incident Command Post in a safe location (primary or alternate)
- Conduct personnel accountability
- Identify exact location and source of fire
- Identify hazards
- Conduct a turnover to the Incident Commander

4. Explosion

4.1. General Personnel Response

- Upon notification or detection of an explosion, personnel will evacuate the affected building, call 911, the control room, and the BED once in a safe location.

- Evacuate the building to the pre-defined staging area.

- Accountability will be conducted.

4.2. Emergency Response Organization Response

- Confirm that 911 and HFD have been notified and are responding
- Follow emergency plan implementing procedures as applicable
- Activate and initial Incident Command Post in a safe location (primary or alternate)
- Conduct personnel accountability
- Identify exact location and source of explosion
- Identify hazards
- Conduct a turnover to the Incident Commander

Appendix 8A

Appendix 8A
RPP-WTP Dangerous Waste Training Plan

BNFL Inc.

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Contents

Item — Page Number

Acronyms and Abbreviations v

1. Purpose [H] 1

2. Scope [H] 1

3. Training Responsibilities [H-1] 1

3.1. President and CEO 1

3.2. Vice President, Operations 2

3.3. Training Manager 2

3.4. Training Specialist 2

3.5. Training Personnel 3

3.6. Functional and Line Managers 3

3.7. Employees 3

4. Implementation of Training Program [H-1 and H-3] 3

4.1. Identification of Training Requirements 4

4.2. Dangerous Waste Worker Positions 4

4.2.1. All Employee 4

4.2.2. General Worker 4

4.2.3. Advanced General Worker 5

4.2.4. Manager 5

4.3. Type of Training 6

4.3.1. Training for Emergency Response 6

4.3.2. Subcontractor Personnel Training 7

4.4. Relevance of Training to Positions 7

4.5. Conduct of Training 8

4.6. Documentation of Training 8

References 9

Appendix A ..... A-i

RCRA Training Program Course Descriptions ..... A-i

Appendix B Required Training for RPP-WTP Personnel [H2] ..... B-i

Acronyms and Abbreviations

BED	Building Emergency Director
CFR	*Code of Federal Regulations*
DOE	US Department of Energy
DWTP	Dangerous Waste Training Program
ERO	Emergency Response Organization
HLW	high-level waste
LAW	low-activity waste
OJT	on-the-job training
RCRA	*Resource Conservation and Recovery Act of 1976*
RPP-WTP	River Protection Project - Waste Treatment Plant
TSD	treatment, storage, or disposal
WAC	*Washington Administrative Code*

1. Purpose [H]

This document outlines the Dangerous Waste Training Program (DWTP) for the River Protection Project - Waste Treatment Plant (RPP-WTP). This program is only part of the RPP-WTP training program, and is designed to specifically address dangerous waste training requirements in the operations phase of the project. On completion of the permitting process, the RPP-WTP will be permitted for treatment and storage of dangerous waste on the Hanford Site.

The training program is designed to comply with the requirements of *Washington Administrative Code* (WAC) 173-303-330, *Code of Federal Regulations* 40 CFR 264.16, and Condition II.C of the *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste* (Ecology 1994) (Hanford Facility site-wide permit), for the development of a written dangerous waste training program.

WAC 173-303-330 requires preparation of a written training plan, participation in a training program by personnel involved in dangerous waste management, and management of training records. Condition II.C of the site-wide permit provides additional training requirements that apply specifically to personnel on the Hanford Site. The training requirements specified in this plan are tailored to employee duties and responsibilities relevant to their position at the RPP-WTP.

2. Scope [H]

This DWTP applies to personnel who will perform work at the RPP-WTP. This plan defines the minimum required training for employees to perform tasks associated with the management of dangerous or mixed waste(s). Subcontractors will be trained appropriately for the location at which they will work and for the activities they will undertake. As a minimum, training covered under the DWTP will include descriptions of dangerous waste management hazards at the RPP-WTP. Visitors will be briefed on the dangerous waste management hazards of the facility, and will be escorted by individuals who have been trained in the hazards of the plant and emergency response procedures.

The RPP-WTP training program will train employees to operate and maintain the plant in a safe, effective, and environmentally sound manner. This training program will also prepare employees to operate and maintain the RPP-WTP under normal, abnormal, and emergency conditions.

3. Training Responsibilities [H-1]

This section describes the responsibilities of the RPP-WTP President and CEO, Vice President of Operations, training manager, training specialist, environmental training lead, training personnel, functional and line managers, and employees, with respect to the DWTP.

3.1. President and CEO

The RPP-WTP President and CEO has the overall responsibility to meet all training requirements of WAC 173-303-330 and Condition II.C. of the Hanford Facility *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste* (Ecology 1994).

The President and CEO is also responsible for the following:

- Reviewing and approving the continuous improvement criteria for the training and development program
- Establishing training requirements for the personnel reporting directly to the President and CEO on the organization chart
- Maintaining the option to change the reporting relationship of the training department

3.2. Vice President, Operations

The Vice President, Operations, is responsible for the following:

- Assigning qualified personnel to perform project tasks
- Establishing training requirements for project personnel reporting directly to the Vice President on the organization chart
- Reviewing job responsibilities and scope-of-work assignments to ensure that the training program is maintained current with the work scope and is updated to improve overall work performance

3.3. Training Manager

To ensure an effective training program, the training manager will be knowledgeable in dangerous waste management. At a minimum, the training manager will have a Bachelor's Degree. Appendix B gives the training requirements for this function. The training manager is responsible for the following:

- Establishing, conducting, and administering the training and development program that achieves safety, quality, and business goals, and complies with relevant permits, technical safety requirements, and regulations
- Establishing an auditable training records system
- Reviewing training requirements whenever regulations change, or annually, as a minimum, for adherence to regulations and to ensure the requirements reflect the current systems, procedures, and policies applicable to each position

3.4. Training Specialist

The training specialist is responsible for developing and administering the project training and development program. Specifically, the training specialist is responsible for the following:

- Assisting functional and line managers in evaluating the training needs of their departments and in developing appropriate training, qualification, and certification packages
- Maintaining up-to-date personnel training records for assigned personnel
- Managing the dangerous waste training program

3.5. Training Personnel

Assigned training personnel are responsible for the following:

- Developing and conducting training on new or existing systems, equipment, or dangerous waste policies and procedures
- Reviewing "Lessons Learned" and including applicable topics to the RPP-WPT DWTP

3.6. Functional and Line Managers

The term "functional and line managers" refers to the structure of the organization. The actual functions these managers perform will vary depending on their area of responsibility.

Functional and line managers are responsible for the following:

- Determining required training for all personnel assigned to the RPP-WTP
- Ensuring personnel assigned to the plant receive required initial training, continuing training, and re-training, as needed, to be qualified to perform their assigned duties in dangerous waste management
- Reviewing job responsibilities and scope-of-work assignments to ensure the training program is maintained current with the work scope and is updated to improve overall work performance

3.7. Employees

All RPP-WTP employees are responsible for the following:

- Working with their managers to define applicable training
- Completing necessary training to gain or maintain qualifications

4. Implementation of Training Program [H-1 and H-3]

The RPP-WTP DWTP is implemented based on training requirements related to assigned responsibilities. Personnel subject to the DWTP will complete required training before performing unsupervised work at the RPP-WTP.

Personnel newly hired to the RPP-WTP, or performing additional or different dangerous waste functions within the plant, will complete the required dangerous waste training within 6 months after starting the assignment. Personnel who have not completed the required training will be placed under the supervision of a trained employee for dangerous waste related work. Functional managers and line managers will be responsible for ensuring that operations personnel are trained, and that required qualifications and certifications are maintained.

4.1. Identification of Training Requirements

Required training is determined by conducting an analysis of the employee's specific job duties. Required dangerous waste training is based on the functions described in Appendix B, Table B-1, Required Training for RPP-WTP Personnel. The operations manager, functional managers, and line managers will identify training needs and implement training requirements for personnel in their departments, with assistance from the training department.

4.2. Dangerous Waste Worker Positions

There are four dangerous waste worker positions: (1) All Employee, (2) General Worker, (3) Advanced General Worker, and (4) Manager. Each position is defined by the dangerous waste related functions performed by the personnel in that position. The position is indicative of the level of responsibility required to perform the functions. Personnel are placed in a position based on duties and responsibilities, as determined by a job analysis or management assessment. Personnel are trained to perform the functions assigned, and as a result may perform a few or several functions. It is possible for a person to be assigned functions in more than one position. Training records will indicate the functions a person is assigned to perform and the training related to that function.

The functions associated with dangerous waste management at RPP-WTP are listed below in sections 4.2.1 through 4.2.4.

4.2.1. All Employee

Functions in this position are those that do not fall into one of the other three positions and have no direct associations with dangerous waste management. The functions included in this position may include clerical duties, management duties (unrelated to dangerous waste management), training, and similar functions.

Other non-RPP-WTP personnel who complete work in controlled areas, but who do not become involved in the management of dangerous waste, are categorized as All Employee.

4.2.2. General Worker

General Workers perform functions with limited dangerous waste management duties, such as activities associated with the generation of dangerous waste or facility maintenance or modification.

Specific functions in the General Worker position may include (but not be limited to) the following:

- Placing waste into pre-approved containers and filling out log sheets where applicable
- Completing radiological surveys of dangerous or mixed waste
- Moving containers or loading packaged containers onto trucks
- Responding to a spill or release of known contents where duties and responsibilities are limited to containing the spill or release, returning the container to an upright position, or placing the known spilled material or waste into a pre-approved container
- Applying container markings or labels

- Developing or conducting dangerous waste training

4.2.3. Advanced General Worker

Advanced General Workers perform functions that exceed the responsibilities of those of a General Worker. The typical functions performed by personnel in this position are laboratory analysis, sampling, and preparing waste for treatment, storage, or disposal.

Specific functions included in the Advanced General Worker position may include (but not be limited to) the following:

- Determining container markings and labels
- Preparing container log sheets
- Completing waste inventories
- Sampling of waste
- Packaging and transporting waste samples
- Responding to spills and releases of waste in accordance with approved procedures
- Performing inspections and surveillance
- Receiving transfers or shipments of waste
- Conducting inspections on tank systems and ancillary equipment
- Transferring or shipping waste from the tank system
- Completing waste designations, and preparing and signing waste transfer documentation for both onsite and offsite shipments of dangerous waste

4.2.4. Manager

Managers coordinate, direct, and oversee the work of General Workers, or Advanced General Workers, in the management of dangerous waste or in the operation and control of the RPP-WTP. Other functions may include responsibilities during emergency events that require implementation of the Emergency Plan.

Functions performed by personnel in the position of Manager may include (but not be limited to) the following:

- Directing, controlling, and coordinating the storage, transfer, and disposal of dangerous waste
- Maintaining operational records
- Reviewing and approving RPP-WTP operating procedures
- Recognizing and responding to abnormal or emergency conditions

- Ensuring that emergency and monitoring equipment, process equipment, procedures, and designs comply with federal and state regulations, national standards, and applicable engineering procedures and management standards

- Maintaining operating documentation and procedures, flow sheets, sample schedules, specifications, process test plans and procedures, and operational safety requirements

- Reviewing and approving engineering design documents and drawings for compliance to applicable policies, procedures, and instructions, per national standards and codes

- Providing technical assistance for hazardous material and dangerous waste spill response

- Supervising and coordinating dangerous waste transfer, storage, and disposal

- Providing approved storage containers and applicable markings

- Preparing and maintaining applicable waste handling documentation in accordance with federal and state regulations

- Providing waste disposition instructions

4.3. Type of Training

This section provides an overview of dangerous waste management and job-specific training provided to employees in job categories involving dangerous waste operations. All employees will receive an orientation that includes identification of dangerous waste management contacts and an introduction to waste minimization. In addition to normal operating conditions training, the types of training employees receive is dependent on the worker position categories.

The matrix shown in Appendix B summarizes the training required, by worker position, for typical dangerous waste functions assigned to personnel at the RPP-WTP (see section 4.2 for a description of dangerous waste activities that determine placement of workers into one of the four worker categories.)

The DWTP will use existing courses and other training materials to the maximum extent practical, ranging from introductory to task-specific dangerous waste training. Appendix A provides a list of representative courses with brief descriptions, required for the four worker positions. Appendix B provides a matrix of functions within the worker positions and required training for each function.

The operations manager, along with functional and line managers, and in coordination with the training department, will be responsible for identifying individual employee training requirements and ensuring requirements are met, in accordance with this plan, before unsupervised work is performed.

4.3.1. Training for Emergency Response

The Building Emergency Director (BED), has the unilateral authority and responsibility to implement the RPP-WTP Emergency Plan, and will exercise overall emergency management responsibility. The BED responsibilities are assigned to the shift operations manager. The operations support manager will appoint operations staff to the Emergency Response Organization (ERO) and coordinate the appointments of other support organizations. The RPP-WTP ERO will ensure that, in the event of an emergency, actions will be taken to prevent or minimize impacts to workers, the public, the Hanford Site, the

RPP-WTP, and the environment. The ERO will be staffed with primary and backup personnel who are trained to perform assigned emergency response functions.

40 CFR 264.16 and WAC 173-303-330 require that employees be able to respond effectively to emergencies and familiarize themselves with emergency procedures, emergency equipment, and emergency systems. Specific topics required by federal and state dangerous waste regulations are addressed throughout the DWTP. ERO members will be required to successfully complete one or more of the following training courses, depending on their level of responsibility:

- Waste Management Awareness
- Facility Orientation (including building emergency plan)
- BED Training

In addition to the above-mentioned courses, the ERO will be required to participate in drills and exercises. The RPP-WTP Emergency Management Plan (BNFL 2000) provides additional details on training requirements for the ERO.

4.3.2. Subcontractor Personnel Training

Subcontractor personnel who require unescorted access to the RPP-WTP will complete training required by this plan and applicable procedures, which implement WAC 173-303-330 and 40 CFR 264.16. The level of training depends on the activities that will be undertaken, but includes, as a minimum, a description of dangerous waste hazards at the RPP-WTP. Qualification will be attained by meeting the requirements stated in plant manuals. RPP-WTP personnel who are current in required training will supervise subcontractor personnel.

The RPP-WTP President & CEO will have the overall responsibility for ensuring that subcontractor personnel meet applicable access requirements before they are granted unescorted access to the plant. The functional managers and line managers will ensure that access requirements are met for visitor and subcontractor personnel accessing areas and activities under their supervision.

4.4. Relevance of Training to Positions

The RPP-WTP DWTP will ensure that personnel responsible for waste handling are properly trained and qualified to perform the job duties pertinent to the handling, storage, and disposal of dangerous waste. Personnel responsible for performing inspections of security systems, emergency equipment, container storage areas, tank systems, containment buildings, and vitrification and emission control systems will be trained to ensure that consistent, effective inspections are conducted. Qualification will be attained by meeting the requirements of a position-specific training program. This program will include minimum education and experience requirements, and specify the training necessary to ensure the safe performance of assigned tasks.

After completing a job analysis for selected positions, the training program will be developed based on federal and state regulations. Tasks performed by employees will be identified and evaluated to determine training requirements. In addition, the training program will be periodically evaluated to ensure it meets current federal and state regulations, changing job responsibilities, and job performance of workers.

The DWTP will apply a performance-based training approach for training programs and development of training materials. This approach to training will use tasks, and related knowledge and skills, to define competent job performance, and will allow participants to practice or demonstrate competency during training.

4.5. Conduct of Training

Training will be provided using an appropriate combination of classroom instruction, on-the-job training (OJT), self-study, required reading, or computer-based training methods. Training will be developed and provided by qualified personnel knowledgeable in dangerous waste management policies and procedures.

RPP-WTP personnel will maintain appropriate knowledge and skills by keeping training current through refresher training and requalification, participating in a job-specific continuing training program, and participating in group discussions and safety pre-job meetings. Employees requiring an applicable Washington State certification will be required to recertify annually or biennially, as appropriate.

4.6. Documentation of Training

Classroom training will be documented on course completion rosters, which will be signed by personnel attending the course. The completion of training will be documented by hardcopy (paper), supported by an electronic data storage record. The hardcopy is the record copy for regulatory purposes.

The training department will maintain training records in the plant operating record, in accordance with this plan and applicable procedures, which implement WAC 173-303-330(2) and (3). Training requirements, course completions, and oral or written performance evaluations will be documented in the facility training record files.

When a training record is requested, during an inspection or assessment, an electronic data storage record will be provided. If an electronic data storage record does not supply the requested information, a hard copy training record will be provided.

References

40 CFR 264. *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilites.* Code of Federal Regulations.

BNFL. 2000. *River Protection Project - Waste Treatment Plant Emergency Management Plan,* PL-W375-SA00004, Revision 0. BNFL Inc., Richland, Washington, USA.

Ecology. 1994. *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste,* WA7890008967. Washington State Department of Ecology, Olympia, Washington, USA.

WAC 173-303. *Dangerous Waste Regulations*. Washington Administrative Code.

Appendix A

RCRA Training Program Course Descriptions

Appendix A
RCRA Training Program Course Descriptions

This section describes the courses that will constitute the DWTP for the RPP-WTP as determined by both the *Dangerous Waste Regulations* (WAC 173-303) and the Hanford Facility *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste* (Ecology 1994). Courses similar to those listed below, used by other Hanford Site treatment, storage or disposal (TSD) facilities, will be provided to applicable RPP-WTP personnel to comply with federal and state training requirements. The training is designed to apply to actual job functions. For example, the program teaches personnel to perform their duties in a way that ensures the RPP-WTP complies with the *Dangerous Waste Regulations*, and to carry out the functions (including contingency plan implementation) relevant to their assignments.

This list will be updated as specific course titles, numbers, and descriptions become available.

Title	**000001 Hanford General Employee Training (RPP-WTP course title: General and Necessary Employee Training)**
Description	Course covers Department of Energy (DOE) Orders and applicable policies pertaining to employer and employee rights and responsibilities, general radiation training, hazard communications, dangerous waste, fire prevention, personal protective equipment, safety requirements, certain unit/building orientation refresher training, emergency preparedness, accident reporting, and safety. The training program identifies this course as an annual refresher for training that is required as a Hanford Facility permit condition.
Mandating document(s)	Hanford Facility *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste,* General Condition II.C.2 and II.C.4 (Ecology 1994)
Target audience	Personnel working at the RPP-WTP
Delivery	Computer-based training with interactive video
Evaluation technique	Computer-based questions and evaluation
Length	Depending on employee's knowledge of material (average 2 to 6 hours)
Frequency	Initial and an annual refresher

Title	**Facility Orientation - Visitors**
Description	Introduction to RPP-WTP including mission, hazards, and emergency response procedures (alarms, emergency egress, assembly points)
Mandating document(s)	Hanford Facility *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste,* General Condition II.C.2 and II.C.4 (Ecology 1994)
Target audience	Personnel visiting the RPP-WTP
Delivery	Video, computer, or recorded message
Evaluation technique	None
Length	≤ 1 hour
Frequency	Initial and weekly, as necessary

Title	XXXXXX Facility Orientation
Description	Introduction to the RPP-WTP, including facility mission, hazards, and emergency response procedures (includes Emergency Plan).
Mandating document(s)	WAC 173-303-330 Hanford Facility *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste*, General Condition II.C.2 (Ecology 1994)
Target audience	All personnel assigned to the RPP-WTP pretreatment, low activity waste (LAW) pretreatment, LAW vitrification, and high level waste (HLW) vitrification plants, and personnel that visit these buildings on a routine basis (more than once a week).
Delivery	Classroom or computer-based
Evaluation technique	Not applicable
Length	1 hour
Frequency	Initial and annual, as appropriate (Refresher training will be conducted annually, unless hazards, or emergency response procedures change. Training that highlights the changes and reviews the unchanged material would then be given. The annual clock would then be reset.)

Title	03EXXX Unit/Building-Specific Plan/Hazard Emergency and Hazard Information Checklist, (A-6000-784R)
Description	Course consists of a review of specific chemical hazards associated with each dangerous waste management unit and job assignment, as covered by a RCRA contingency plan. The training is completed by the supervisor, manager, or a designated individual using a checklist. The unit/building-specific information is reviewed regarding hazards in the work area and emergency response requirements, including, where applicable, procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment, waste feed cutoff, communication and alarm systems, response to fires, response to groundwater contamination incidents, shutdown of operations, and other aspects of facility waste or emergency procedures and operations. The checklist acts as a guide to ensure consistent coverage of necessary topics.
Mandating document(s)	WAC 173-303-330, -340, and -350 Hanford Facility *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste*, General Condition II.C.4 (Ecology 1994)
Target Audience	All personnel assigned to, or performing work at the RPP-WTP who are not required to take the Emergency Procedures/Abnormal Plant Conditions course.
Delivery	One-on-one or as a group with immediate manager or designee
Evaluation technique	Training checklist documentation
Length	Average 2 hours
Frequency	Initial and an annual refresher

Title	XXXXXX Emergency Procedures/Abnormal Plant Conditions
Description	Course consists of a review of abnormal and emergency conditions that could occur in the RPP-WTP (associated alarms and communications) and proper responses.
Mandating documents	WAC 173-303-330 Hanford Facility *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste*, General Condition II.C.2 (Ecology 1994)
Target audience	All personnel assigned to the RPP-WTP pretreatment, LAW pretreatment, LAW vitrification, and HLW vitrification plants, and personnel that visit these buildings on a routine basis (more than once a week).
Delivery	Classroom
Evaluation technique	Written examination or other evaluation method, as appropriate
Length	4 hours
Frequency	Initial and annual, as appropriate (Refresher training will be conducted annually, unless changes to the alarms, communications, or procedures occur. Training would then be given on these changes, and the examination would include questions over the unchanged material. The annual clock would then be reset.)

Title	02006G Waste Management Awareness
Description	Course introduces workers to federal laws governing chemical safety in the workplace. The course provides the hazardous material/waste worker with the basic fundamentals for safe use of hazardous materials and initial accumulation or storage of dangerous or mixed waste in containers. The concepts covered in this course instruct personnel on specific waste generation procedures and requirements, which include (1) applicable waste management practices (i.e., waste stream identification, waste segregation practices, completing container log sheets, and housekeeping requirements), (2) proper responses to incidents pertaining to the waste in the initial accumulation containers, (3) proper responses to managing waste of unknown origins, and (4) proper responses to questions posed in the field regarding the above elements. Other courses may provide equivalent training.
Mandating document(s)	WAC 173-303-330(1) Hanford Facility *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste,* General Conditions II.C.1 and II.C.4 (Ecology 1994)
Target audience	General Worker, Advanced General Worker, and Managers
Delivery	Classroom
Evaluation technique	Written exam or other evaluation method, as appropriate
Length	4 hours
Frequency	Initial

Title	035100 Container Waste Management
Description	Course covers general training requirements pertaining to waste management in containers at 90-day accumulation areas and TSD facilities. The course incorporates WAC 173-303-200(1) for container management. Includes practical exercises for hands-on experience with the packaging of dangerous or mixed waste, and preparation of packages for final destination. This course does not cover waste management aspects pertaining to other dangerous waste management units such as tank systems or containment buildings.
Mandating document(s)	WAC 173-303-330(1), -630, -200(1)
Target audience	Personnel assigned to manage dangerous waste, and their immediate managers.
Delivery	Classroom
Evaluation technique	Written exam or other evaluation method, as appropriate
Length	16 hours
Frequency	Initial and an annual refresher

Title	035120 Waste Management Administration - Initial
Description	Course is designed for personnel preparing to become shippers of dangerous or mixed waste. This course covers regulatory and company policies, forms, reports, forecasts, and plans. Topics also covered include waste characterization and waste storage disposal requests. In addition, students will learn how these forms are used to complete shipping papers.
Mandating document(s)	WAC 173-303-330(1), -630, -200, -210, -220, -380, and -390.
Target audience	Personnel assigned to complete paperwork associated with the management of dangerous or mixed waste, and managers with environmental responsibilities
Delivery	Classroom
Evaluation technique	Written exam or other evaluation method, as appropriate
Length	8 hours
Frequency	Initial and an annual refresher

Title	02028B Building Emergency Director Training
Description	Course provides an overview of the responsibilities of the BED, identifies the building emergency organization and actions required during an event, discusses emergencies involving dangerous waste, implementation of the contingency plan, and drill and exercise requirements.
Mandating document(s)	WAC 173-303-330(1), -340, -350, and –360
Target audience	Shift operations managers designated to perform the responsibilities of a BED.
Delivery	Classroom
Evaluation technique	Written exam or other evaluation method, as appropriate
Length	16 hours
Frequency	Initial and an annual refresher

Title	020159 Advanced Course 2 - Hazardous Waste Shipper Certification
Description	Course introduces waste handlers/shippers to responsibilities and liabilities with regard to compliance to manifesting requirements and Department of Transportation regulations, including placarding, identifying proper shipping names, and loading requirements.
Mandating document(s)	WAC 173-303-330(1), 180, 190, and 370 Hanford Facility *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste,* General Conditions II.Q (Ecology 1994), as applicable
Target audience	Personnel assigned the function of shipping dangerous or mixed waste, and their managers.
Delivery	Classroom
Evaluation technique	Written exam or other evaluation method, as appropriate
Length	24 hours
Frequency	Initial and every 3 years

Title	035010 Waste Designation
Description	Course teaches dangerous waste designation according to WAC 173-303. Class content includes section-by-section lecture on the regulations, with examples following each section. Students complete examples using a waste designation flow chart. Examples addressed include listed waste, characteristic waste, and the Washington State criteria for toxicity and persistence.
Mandating document(s)	WAC 173-303-330(1), -070, and -080 through –100
Target audience	Personnel assigned the function of designating waste, and managers with environmental responsibilities
Delivery	Classroom
Evaluation technique	Written exam or other evaluation method, as appropriate
Length	8 hours
Frequency	Initial and an annual refresher

Title	035020 Facility Waste Sampling and Analysis
Description	Course presents documentation requirements for a sampling plan, a waste analysis plan, field and laboratory quality control/assurance requirements, the data quality objective process, and the use of sampling methods and equipment as specified by WAC 173-303-110. Sample management and available onsite sampling services are also discussed.
Mandating document(s)	WAC 173-303-330(1), -070, -110, and –300
Target audience	Personnel assigned to sample or analyze dangerous or mixed waste, and managers with environmental responsibilities
Delivery	Classroom
Evaluation technique	Written exam or other evaluation method, as appropriate
Length	8 hours
Frequency	Initial and an annual refresher

Title	XXXXXX Inspection Methodology
Description	Course focuses on inspection. The proper processes for inspection planning, preparation, performance, reporting, and resolution is discussed in detail.
Mandating document(s)	WAC 173-303-320
Target audience	Personnel assigned to conduct inspections of dangerous waste management units.
Delivery	Classroom and OJT
Evaluation technique	Written test or other evaluation method, as appropriate
Length	16 hours
Frequency	Initial and every 3 years

1

Title	031110 24 Hour Hazardous Waste Worker
Description	Course provides information for the safe operation of RCRA TSD facilities.
Mandating document(s)	29 CFR 1910.120
Target audience	Personnel assigned to dangerous waste functions
Delivery	Classroom
Evaluation technique	Written test or other evaluation method, as appropriate
Length	24 hours
Frequency	Initial

2

Title	032020 – 8 Hour Hazardous Waste Refresher
Description	Provides a review of topics covered by the 24 Hour Hazardous Waste Worker course.
Mandating document(s)	29 CFR 1910.120
Target audience	Personnel assigned to dangerous waste functions who have already completed the 24 Hour Hazardous Waste Worker course
Delivery	Classroom
Evaluation technique	Written exam or other evaluation method, as appropriate
Length	8 hours
Frequency	Annually

3

Title	031310 – 8 Hour Hazardous Waste Manager and Supervisor
Description	Provides information on the following topics: Safety and Health program, Training program, Personnel Protective Equipment program, Spill Containment program, and health hazards monitoring procedures and techniques.
Mandating document(s)	29 CFR 1910.120
Target audience	Managers and Supervisors who have taken the 24 Hour Hazardous Waste Worker course
Delivery	Workshop
Evaluation technique	None
Length	8 hours
Frequency	Initial

Appendix B
Required Training for RPP-WTP Personnel [H2]

The following matrix summarizes the training required for personnel performing dangerous waste activities at the RPP-WTP. Section 4.2 gives additional detail on the functions of each dangerous waste worker position.

Table B-1. Required Training for RPP-WTP Personnel

Dangerous Waste Worker Position	Dangerous Waste Functions	General & Necessary Employee Training	Facility Orientation[a]	Unit/Building—Specific Emerg. & Haz. Info. Checklist	Emergency Procedures / Abnormal Plant Conditions	Waste Management Awareness	Waste Management Administration	Container Waste Management[a]	Building Emergency Director Training[a]	Hazardous Waste Shipper Certification	Waste Designation	Facility Waste Sampling & Analysis	Surveillance Methodology	24 Hour Hazardous Waste Worker	8 Hour Hazardous Waste	8 Hour Hazardous Waste Manager and Supervisor
All Employee	No dangerous waste responsibilities	•	•	•												
Manager	Maintain knowledge of environmental regulations as related to the RPP-WTP	•	•	•	•	•										
	Manage personnel assigned to operate the plant	•	•	•	•	•		•	•							
	BED	•	•	•	•	•		•	•					•	•	•
	Manage personnel who are assigned dangerous waste management functions	•	•	•	•	•	•	•		•	•	•		•	•	•
	Responsible for the development, administration, and implementation of the dangerous waste training program	•	•	•	•	•										
General Worker	Monitor and control radiological conditions	•	•	•	•	•										
	Respond to spills of dangerous waste	•	•	•	•	•		•						•	•	
	Prepare training courses and deliver training to personnel on the subject of dangerous waste management	•	•	•	•	•										
	Package Dangerous Waste and prepare waste packages for final destination (apply markings and placards)	•	•	•	•	•		•						•	•	

Table B-1. Required Training for RPP-WTP Personnel

Dangerous Waste Worker Position	Dangerous Waste Functions	General & Necessary Employee Training	Facility Orientation[a]	Unit/Building—Specific Emerg. & Haz. Info. Checklist	Emergency Procedures / Abnormal Plant Conditions	Waste Management Awareness	Waste Management Administration	Container Waste Management[a]	Building Emergency Director Training[a]	Hazardous Waste Shipper Certification	Waste Designation	Facility Waste Sampling & Analysis	Surveillance Methodology	24 Hour Hazardous Waste Worker	8 Hour Hazardous Waste	8 Hour Hazardous Waste Manager and Supervisor
Advanced General Worker	Designate waste according to dangerous waste regulations (determine container markings and labels)	•	•	•	•	•	•				•					
	Sample waste and prepare for analysis	•	•	•	•	•	•	•				•		•	•	
	Conduct inspections of dangerous waste management units	•	•	•	•	•	•	•					•	•	•	
	Prepare shipping papers for movement of dangerous waste both onsite and offsite	•	•	•	•	•	•	•		•						
	Operate facility systems (melters, pretreatment systems, treated waste loadout)	•	•	•	•	•		•						•	•	

Notes:
[a] Refresher training required

Appendix 11A

Appendix 11A
Tables and Figures Identifying Dangerous Waste Management Units

Table 11A-1. Container Storage Areas Summary

Container Storage Area	Maximum Waste Volume (gallons)	Dimensions (L × W × H) (feet)
Pretreatment Plant		
Pretreatment Container Storage Area No. 1	119,830	(36 × 40 × 20) + (9 × 18 × 20)
Pretreatment Container Storage Area No. 2	53,856	36 × 20 × 22
Law Pretreatment Plant		
LAW Pretreatment Container Storage Area	9,059	70 × 10 × 23
LAW Vitrification Plant		
ILAW Buffer Container Storage Area	14,138	22 × 63 × 20
ILAW Container Storage Area	309,672	50 × 240 × 35
LAW Container Storage Area	9,575	(21 × 33 × 25) + (28 × 20 × 25)
HLW Vitrification Plant		
IHLW Container Storage Area	16,082	67 × 23 × 27
HLW Container Storage Area No. 1	660	43 × 15 ×37
HLW Container Storage Area No. 2	110	20 × 33 × 25
Other Areas		
Central Waste Storage Area	718,080	120 × 80 × 16
Miscellaneous Dangerous Waste Container Storage Area	440	25 × 30 × 10
Melter Storage Area No. 1	271,973	70 × 45 × 35
Melter Storage Area No. 2	306,980	45 × 75 × 35

Table 11A-2. Containment Buildings Summary

Location	Demensions (L × W × H) (feet)
Pretreatment Plant	
Pretreatment C3 Workshop Containment Building	34 × 124 × 17
Pretreatment Maintenance Containment Building	23 × 92 × 21
LAW Vitrification Plant	
LAW LSM Gallery Containment Building	151 × 62 × 25
ILAW Container Finishing Containment Building	98 × 31 × 25
ILAW Container Fixative Containment Building	20 × 65 × 20
LAW Vitrification Plant C3 Workshop Containment Building	35 × 40 × 20
HLW Vitrification Plant	
HLW Melter Containment Building	35 × 107 × 49
IHLW Container Weld Containment Building	140 × 18 × 48
IHLW Container Decontamination Building	10 × 80 × 58
HLW Vitrification Plant C3 Workshop Containment Building	27 × 66 × 19

1

Table 11A-3. Pretreatment Plant Tank Systems

No.	System	Vessel Number	Cell Number	Description	Mat.	Instrumentation/Indicators	Capacity Maximum (gallons)	Dimensions (D × L) (inches)	PFD Drawing Number DWG-375PT-
1	110	V11020A	001	LAW Feed Receipt Vessel	SS	T, L, D	374,294	552 × 468	PR00017
2	110	V11020B	001	LAW Feed Receipt Vessel	SS	T, L, D	374,294	552 × 468	PR00017
3	110	V11020C	001	LAW Feed Receipt Vessel	SS	T, L, D	374,294	552 × 468	PR00017
4	110	V11020D	001	LAW Feed Receipt Vessel	SS	T, L, D	374,294	552 × 468	PR00017
5	110	V11020E	001	LAW Feed Receipt Vessel	SS	T, L, D	374,294	552 × 468	PR00017
6	110	V11020F	001	LAW Feed Receipt Vessel	SS	T,L, D	374,294	552 × 468	PR00017
7	210	V12001A	004	Envelope D Receipt Vessel	SS	T,L,D	93,376	300 × 416	PR00016
8	210	V12001B	003	Envelope D Receipt Vessel	SS	T, L, D	93,376	300 × 416	PR00016
9	210	V12001C	004	Envelope D Receipt Vessel	SS	T,L,D	93,376	300 × 416	PR000016
10	210	V12001D	004	Envelope D Receipt Vessel	SS	T,L,D	93,376	300 × 416	PR000016
11	210	V12001E	006	Envelope D Receipt Vessel	SS	T, L, D	93,376	300 × 416	PR00016
12	210	V12001F	003	Envelope D Receipt Vessel	SS	T, L, D	93,376	300 × 416	PR00016
13	210	V12002	011U	HLW Acidic Effluent Hold Vessel	SS	T, L, D	93,375	300 × 416	PR00016
14	220	V12004A	008	HLW ultrafiltration Feed Vessel	SS	T, L, D	22,755	162 × 322	PR00016

Table 11A-3. Pretreatment Plant Tank Systems

No.	System	Vessel Number	Cell Number	Description	Mat.	Instrumentation/Indicators	Capacity Maximum (gallons)	Dimensions (D × L) (inches)	PFD Drawing Number DWG-375PT-
15	220	V12004B	008	HLW Ultrafiltration Feed Vessel	SS	T, L, D	22,755	162 × 320	PR00016
16	220	G12001A	011C	HLW Ultrafiltration Unit	SS	P	676	47 × 90	PR00016
17	220	G12001B	011C	HLW Ultrafiltration Unit	SS	P	676	47 × 90	PR00016
18	220	G12002A	011C	HLW Ultrafiltration Unit	SS	P	676	47 × 90	PR00016
19	220	G12002B	011C	HLW Ultrafiltration Unit	SS	P	676	47 × 90	PR00016
20	220	V12006A	008	HLW Ultrafiltration Vessel	SS	T, L, D	25,871	162 × 350	PR00016
21	220	V12006B	008	HLW Ultrafiltration Vessel	SS	T, L, D	25,871	162 × 350	PR00016
22	220	V12006C	008	HLW Ultrafiltration Vessel	SS	T, L, D	25,871	162 × 350	PR00016
23	220	V12007	006	HLW Feed Blending Vessel	SS	T, L, D	17,193	144 × 304	PR00016
24	120	V11001A	012	LAW Feed Evaporator Feed Vessel	SS	T, L, D	118,760	324 × 454	PR00003
25	120	V11001B	002	LAW Feed Evaporator Feed Vessel	SS	T, L, D	118,760	324 × 454	PR00003
26	120	V11002	012	Evaporator Circulation Vessel	SS	T, L, D, Pd, P	39,224	276 × 460	PR00003
27	120	V11005	Process Bulge Area	LAW Feed Evaporator Process Condensate Pot	SS	L	1,077	60 × 118	PR00003
28	230	V12010A	003	Evaporator Concentrate Buffer	SS	T, L, D	57,626	240 × 384	PR00004

Table 11A-3. Pretreatment Plant Tank Systems

No.	System	Vessel Number	Cell Number	Description	Mat.	Instrumentation/Indicators	Capacity Maximum (gallons)	Dimensions (D × L) (inches)	PFD Drawing Number DWG-375PT-
29	230	V12010B	005	Evaporator Concentrate Buffer	SS	T, L, D	57,626	240 × 384	PR00004
30	230	V12011A	008	ultrafiltration Feed Vessel	SS	T, L, D	26,577	168 × 342	PR00004
31	230	V12011B	008	ultrafiltration Feed Vessel	SS	T, L, D	26,577	168 × 342	PR00004
32	230	G12003A	011C	Ultrafilter A	SS	P	676	47 × 90	PR00004
33	230	G12003B	011C	Ultrafilter B	SS	P	676	47 × 90	PR00004
34	230	G12004A	011C	Ultrafilter C	SS	P	676	47 × 90	PR00004
35	230	G12004B	011C	Ultrafilter D	SS	P	676	47 × 90	PR00004
36	230	V12015A	006	LAW Permeate Hold Vessel	SS	T, L, D	27,420	180 × 318	PR00004
37	230	V12015B	005	LAW Permeate Hold Vessel	SS	T, L, D	27,420	180 × 318	PR00004
38	230	V12016A	010	Entrained Solids Hold Vessel	SS	T, L, D	105,739	336 × 398	PR00004
39	230	V12016B	010	Entrained Solids Hold Vessel	SS	T, L, D	105,739	336 × 398	PR00004
40	310	V13001	007	LAW Feed Tank	SS	L	59,509	228 × 421	PR00005
41	310	C13001	007	Cs IX Column	SS	T, P, R	689	30 × 230	PR00005
42	310	C13002	007	Cs IX Column	SS	T, P, R	689	30 × 230	PR00005

Table 11A-3. Pretreatment Plant Tank Systems

No.	System	Vessel Number	Cell Number	Description	Mat.	Instrumentation/Indicators	Capacity Maximum (gallons)	Dimensions (D × L) (inches)	PFD Drawing Number DWG-375PT-
43	310	C13003	007	Cs IX Column	SS	T, P, R	689	30 × 230	PR00005
44	310	C13004	007	Cs IX Column	SS	T, P, R	689	30 × 230	PR00005
45	310	C13011	007	Cs IX Column	SS	T, P, R	689	30 × 230	PR00005
46	310	V13004	007	Treated LAW Collection Tank	SS	L	34,776	162 × 449	PR00005
47	310	V13007	007	Caustic Rinse Tank	SS	L	1,840	72 × 134	PR00005
48	310	V13008	007	Caustic Rinse Collection Tank	SS	L, D	3,290	78 × 142	PR00005
49	320	V13024A	007	Cs Eluate Receipt Vessel	SS	L	10,774	114 × 310	PR00009
50	320	V13024B	007	Cs Eluate Receipt Vessel	SS	L	10,774	114 × 310	PR00009
51	320	V13026	005	Evaporator Kettle	SS	T, P, D, L	3,161	78 × 230	PR00009
52	320	V13028	005	Recovered Acid Tank	SS	L, R	2,188	102 × 110	PR00009
53	320	V13027A	005	Cs Eluate Vessel	SS	T, L, D	10,025	120 × 290	PR00009
54	320	V13027B	005	Cs Eluate Vessel	SS	T, L, D	10,200	120 × 251	PR00009
55	320	V13029	005	Condensate Pot	SS	L	1,100	72 × 75	PR00009
56	320	V13073	007	Cs/Tc Concentrate Storage Tank	SS	L, T	8,142	138 × 216	PR00009

Table 11A-3. Pretreatment Plant Tank Systems

No.	System	Vessel Number	Cell Number	Description	Mat.	Instrumentation/Indicators	Capacity Maximum (gallons)	Dimensions (D × L) (inches)	PFD Drawing Number DWG-375PT-
57	430	V14001	Maintenance Cave	Decon Vessel	SS	L	1,950	5 × 20	M0042 [a]
58	430	V14003	Maintenance Cave	Pump Bowl	SS	L	400	4 × 4	M0042 [a]
59	550	V15013	009	Acidic Effluent Vessel	SS	L, T	89,492	264 × 450	PR00015
60	550	V15009	011U	Plant Wash Vessel	SS	L, T	106,760	336 × 354	PR00015
61	550	V15018	009	Contaminant Effluent Vessel	SS	L	89,492	264 × 450	PR00015

Storage tanks, all other tanks are considered treatment tanks or vessels.

Note:
[a] = Mechanical handling drawing is provided.

Key to Instrumentation/Indicators

T = Temperature indicator
L = Level indicator
P = Pressure indicator
D = Density indicator
Pd = Pressure differential
R = Radiological monitoring

Key to Materials

SS = Stainless Steel

1

Table 11A-4. LAW Pretreatment Plant Tank Systems

No.	System	Vessel Number	Location	Description	Mat.	Instrumentation/Indicators	Capacity Maximum (gallons)	Dimensions (D × L) (inches)	PFD Drawing Number DWG-W375LP-
1	130	V41011	Tc IX	Evaporator Vessel	SS	L, P, T, Pd, D	10,295	162 × 319	PR00008
2	130	V41013	Pump Bulges	Process Condensate Hold Vessel	SS	L	2,044	78 × 133.5	PR00008
3	140	V41001A	LAW Melter Feed/Evaporator	LAW Buffer Vessel A	SS	L,D,T	112,618	288 × 506	PR00009
4	140	V141001B	LAW Melter Feed/Evaporator	LAW Buffer Vessel B	SS	L,D,T	112,618	288 × 506	PR00009
5	330	V43001A	Feed Receipt	Tc IX Buffer Vessel	SS	L	55,579	440.4 × 222	PR00006
6	330	V43001B	Feed Receipt	Tc IX Buffer Vessel	SS	L	55,579	440.4 × 222	PR00006
7	330	V43056	Tc IX	Caustic Rinse Collection Tank	SS	L,D	1,645.8	172.8 × 58.8	PR00006
8	330	C43006	Tc IX	Tc IX Column	SS	T,P,R	1,101	30 × 230	PR00006
9	330	C43007	Tc IX	Tc IX Column	SS	T,P,R	1,101	30 × 230	PR00006
10	330	C43008	Tc IX	Tc IX Column	SS	T,P,R	1,101	30 × 230	PR00006
11	330	C43009	Tc IX	Tc IX Column	SS	T,P,R	1,101	30 × 230	PR00006
12	330	V43110A	Tc IX	Treated LAW Buffer Vessel	SS	P	32,224	168 × 399	PR00006
13	330	V43110B	Tc IX	Treated LAW Buffer Vessel	SS	P	32,224	168 × 399	PR00006
14	330	V43110C	Tc IX	Treated LAW Buffer Vessel	SS	P	32,224	168 × 399	PR00006

Table 11A-4. LAW Pretreatment Plant Tank Systems

No.	System	Vessel Number	Location	Description	Mat.	Instrumentation/Indicators	Capacity Maximum (gallons)	Dimensions (D × L) (inches)	PFD Drawing Number DWG-W375LP-
15	340	V43067A	Tc IX	Tc Eluant Receipt Vessel	SS	L	21,607	156 × 318	PR00010
16	340	V43067B	Tc IX	Tc Eluant Receipt Vessel	SS	L	21,607	156 × 318	PR00010
17	340	V43071	Tc IX	Recovery Acid Vessel	SS	L,R	2,504	109.2 × 102	PR00010
18	340	V43070A	Tc IX	Tc Eluant Vessel	SS	L,P,D,T	16,931	156 × 268	PR00010
19	340	V43070B	Tc IX	Tc Eluant Vessel	SS	L,P,D,T	16,931	156 × 276	PR00010
20	370	V43135A	Feed Receipt	Spent Resin Collection Vessel	SS	L	6,631	195.6 × 117.6	PR00012
21	370	V43135B	Feed Receipt	Spent Resin Collection Vessel	SS	L	6,631	195.6 × 117.6	PR00012
22	370	V43136	Feed Receipt	Resin Flush Collection Vessel	SS	L	9,808	206.4 × 141.6	PR00012
23	510	V45028A	Condensate Collection	Process Condensate Vessel	SS	L	308,412	480 × 612	PR00002
24	510	V45028B	Condensate Collection	Process Condensate Vessel	SS	L	308,412	480 × 612	PR00002
25	510	V45028C	Condensate Collection	Process Condensate Vessel	SS	L	308,412	480 × 612	PR00002
26	550	V45009	Tc IX	Plant Wash Vessel	SS	L,T	24,322	216 × 238	PR00015
27	550	V45013	Tc IX	Alkaline Effluent Vessel	SS	L,T	47,613	216 × 385	PR00015
28	550	V45018	Tc IX	Alkaline Effluent Vessel	SS	L	47,613	216 × 385	PR00015

Storage tanks, all other tanks are considered treatment tanks or vessels.

Table 11A-4. LAW Pretreatment Plant Tank Systems

No.	System	Vessel Number	Location	Description	Mat.	Instrumentation/Indicators	Capacity Maximum (gallons)	Dimensions (D × L) (inches)	PFD Drawing Number DWG-W375LP-

Key to Instrumentation/Indicators

T = Temperature indicator
L = Level indicator
P = Pressure indicator
D = Density indicator
Pd = Pressure differential
R = Radiological monitoring

Key to Materials

SS = Stainless Steel

1

Table 11A-5. LAW Vitrification Plant Tank Systems

No.	System	Vessel No.	Location	Description	Mat.	Instrumentation/Indicators	Maximum Capacity (gallons)	Dimensions (D × L) (feet)	PFD Drawing Number DWG-375LV-
1	LV-110	V21001	L-186	LAW Concentrate Vessel	SS	T, L, D	11,000	14 × 14.5	PR01001
2	LV-110	V21002	L-187	LAW Concentrate Receipt Vessel	SS	T, L, D	11,000	14 × 14.5	PR01001
3	LV-110	V21003	L-188	LAW Concentrate Receipt Vessel	SS	T, L, D	11,000	14 × 14.5	PR01001
4	LV-131	V21101	L-186	LAW Melter 1 Feed Preparation Vessel	SS	T, L, D	4,200	10 × 10.8	PR01001
5	LV-132	V21201	L-187	LAW Melter 2 Feed Preparation Vessel	SS	T, L, D	4,200	10 × 10.8	PR01001
6	LV-133	V21301	L-188	LAW Melter 3 Feed Preparation Vessel	SS	T, L, D	4,200	10 × 10.8	PR01001
7	LV-131	V21102	L-186	LAW Melter 1 Feed Vessel	SS	T, L, D	4,300	10 × 10.9	PR01001
8	LV-132	V21202	L-187	LAW Melter 2 Feed Vessel	SS	T, L, D	4,300	10 × 10.9	PR01001
9	LV-133	V21302	L-188	LAW Melter 3 Feed Vessel	SS	T, L, D	4,300	10 × 10.9	PR01001
10	LV-231	V22101	L-186	SBS Condensate Vessel 1	SS	T, L, D	6,200	12 × 12	PR01002
11	LV-232	V22201	L-187	SBS Condensate Vessel 2	SS	T, L, D	6,200	12 × 12	PR01003
12	LV-233	V22301	L-188	SBS Condensate Vessel 3	SS	T, L, D	6,200	12 × 12	PR01004
13	LV-234	V22001	L-333	Caustic Collection Vessel	SS	T, L, D, R, pH	13,600	13.5 × 18	PR01006

Table 11A-5. LAW Vitrification Plant Tank Systems

No.	System	Vessel No.	Location	Description	Mat.	Instrumentation/Indicators	Maximum Capacity (gallons)	Dimensions (D × L) (feet)	PFD Drawing Number DWG-375LV-
14	LV-510	V25003	L-189	SBS Condensate Collection Vessel	SS	T, L, D	18,600	16 × 18	PR01006
15	LV-510	V25001	L-189	LAW Plant Wash Vessel	SS	T, L, D	18,600	16 × 18	PR01006
16	LV-510	V25002	L-007	C3/C5 Drain/Sump Collection Vessel	SS	T, L, D	13,400	13.5 × 18	PR01006

Key to Instrumentation/Indicators

T = Temperature Indicator
L = Level indicator
P = Pressure indicator
D = Density indicator
R = Radiation monitor

Key to Materials

SS = Stainless Steel
H = Hastalloy C-22

NOTE: Materials of construction are preliminary and subject to change.

1

Table 11A-6. HLW Vitrification Plant Tank Systems

No.	System	Vessel No.	Location	Description	Mat.	Instrumentation/Indicators	Maximum Capacity (gallons)	Dimensions (D × L) (feet)	PFD Drawing Number DWG-W375HV-
1	HV-110	V31001	H-027	HLW Concentrate Vessel	SS	T, L, D, P	7,600	10.5 × 15.8	PR00031
2	HV-110	V31002	H-027	HLW Concentrate Receipt Vessel	SS	T, L, D, P	7,600	10.5 × 15.8	PR00031
3	HV-131	V31101	H-153	HLW Feed Preparation Vessel	SS	T, L, D, P	2,100	7 × 9.7	PR00031
4	HV-131	V31102	H-153	HLW Melter Feed Vessel	SS	T, L, D, P	2,100	7 × 9.7	PR00031
5	HV-231	V32101	H-035	SBS Condensate Vessel	H	T, L, D, P	2,700	10 × 8.5	PR00031
6	HV-231	V32001	H-004	Scrubber Collection Vessel	SS	L, D	4,900	8 × 16	PR00032
7	HV-330	V33001	H-059	Canister Decontamination Vessel	T	T, L, D, P	560	2.5 × 16	PR00035
8	HV-330	V33002	H-059	Waste Neutralization Vessel	T	T, L, D, P	2,300	5.9 × 13.4	PR00035
9	HV-510	V35001	H-004	Low Active Effluent Vessel	SS	T, L, D, P	9,700	12 × 16	PR00036
10	HV-510	V35009	H-027	Decon Effluent Collection Vessel	SS	T, L, D, P	2,600	8 × 10.3	PR00032
11	HV-510	V35002	H-027	Acidic Waste Vessel	SS	T, L, D, P	5,800	10 × 13.8	PR00036
12	HV-510	V35003	H-027	HLW Plant Wash Vessel	SS	T, L, D, P	11,700	12 × 18	PR00036

Table 11A-6. HLW Vitrification Plant Tank Systems

No.	System	Vessel No.	Location	Description	Mat.	Instrumentation/Indicators	Maximum Capacity (gallons)	Dimensions (D × L) (feet)	PFD Drawing Number DWG-W375HV-

Key to Instrumentation/Indicators

T = Temperature indicator
L = Level indicator
P = Pressure indicator
D = Density indicator
Pd = Pressure differential indicator

Key to Materials

SS = Stainless Steel
H = Hastalloy C-22
T = Titanium

NOTE: Materials of construction are preliminary and subject to change.

1

Table 11A-7. Secondary Containment Liner in Cells and Caves in the RPP-WTP

Cell/Cave	(L×W) (feet)	Tanks in Cell/Cave	Volume of Largest Tank in Cell/Cave (gallons)	Secondary Containment Liner Height (feet)	
				Calculated	Projected
Pretreatment Plant					
001	117.0 × 159.0	V-11020 A, V-11020B, V-11020 C, V-11020 D, V-11020 E, V-11020 F	445,655	6.8	7.0
002	37.1 × 37.5	V11001B	118,760	12.6	13.5
003	96.4 × 37.5	V-12001B, V-12001F	93,376	5.6	6.0
004	96.4 × 41.5	V-12001A, V-12001C, V-12001D	93,376	5.3	5.5
005	62.5 × 37.5	V-12010B	57,626	5.5	5.5
006	62.5 × 41.5	V-12001E	93,376	6.6	7.0
007	81.5 × 37.5	V-13001	66,507	4.7	5.5
008	81.5 × 41.5	V-12011A, V-12011B	26,577	2.7	3.5
009	70.5 × 37.5	V-15018, V-15013,	89,492	6.4	6.5
010	69.5 × 40.5	V-12016A, V-12016B	84,096	6.4	6.5
011C	See Note 1	G12001A, G12001B, G12002A, G12002B	676	See Note 1	See Note 1
011U	70.0 × 33.0	V-15009	105,739	See Note 1	See Note 1
012	37.1 × 41.5	V-11001A	118,760	11.5	12.5
Maintenance Cave	26.0 × 9.0	V14001	1,950	2.0	3.0
LAW Pretreatment Plant					
LAW Melter Feed Evaporator	31.0 × 30.0	V41001A	129,725	19.8	21.0
LAW Melter Feed Evaporator	30.0 × 30.0	V41001B	129,725	20.4	21.5
Tc IX	66.5 × 31.0	V43110A, V43110B, V43110C	35,898	4.4	4.5
Tc IX	66.5 × 30.0	V45013, V45018	51,562	5.9	6.0
Effluent Receipt	43.0 x 30.0	V43001A	67,858	8.8	9.0
Feed Receipt	43.0 x 31.0	V43001B	67,858	8.8	9.0
Condensate Collection	143.0 x 69.0	V45028A, V45028B, V45028C	357,295	7.6 (See Note 2)	8.0

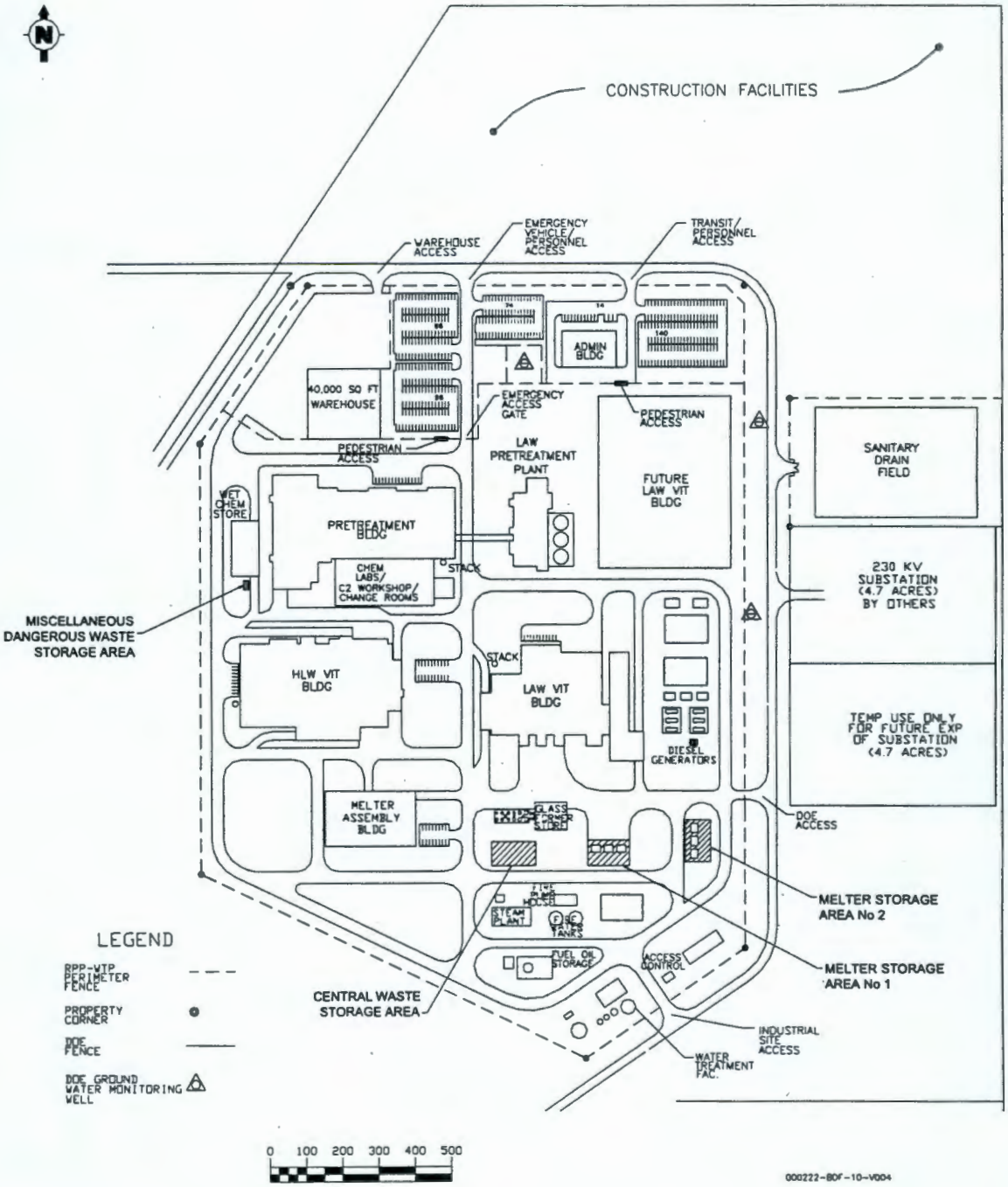
Table 11A-7. Secondary Containment Liner in Cells and Caves in the RPP-WTP

Cell/Cave	(L×W) (feet)	Tanks in Cell/Cave	Volume of Largest Tank in Cell/Cave (gallons)	Secondary Containment Liner Height (feet)	
				Calculated	Projected
LAW Vitrification Plant					
L-186 (Melter 1 Process Cell)	48 × 38	V21001	14,000	1.4	1.5
L-187 (Melter 2 Process Cell)	48 × 38	V21002	14,000	1.4	1.5
L-188 (Melter 3 Process Cell)	48 × 38	V21003	14,000	1.4	1.5
L-189 (Effluent Cell)	38 × 31	V25001, V25003	24,000	3.7	4.0
L-333 (Caustic Scrub Blowdown Collection Room)	31 × 27	V22001	17,000	3.3	3.5
L-007 (C3/C5 Drain Tank Room)	18 × 18	V25002	16,750	11.3	11.5
HLW Vitrification Plant					
H-004 (Secondary Offgas Scrubber)	40.5 × 21.5 (length irregular)	V35001	11,600	2.3	2.5
H-153 (No. 1 - Tank Area)	50.75 × 12.3	V31101, V31102	3,820	0.05 (within curbed area)	1.0
H-059 (Canister Decontamination Cell)	8 × 23.5	V33002	2,508	2.1	2.5
H-035 (SBS Drain Collection Cell No. 1)	12.5 × 16.5	V32101	3,700	3.9	4.0
H-027 (Wet Process Cell)	18 × 64	V35003	13,600	2.3	2.5
H-027 (Wet Process Cell)	17 × 18	V35009	3,200	1.7	2.0

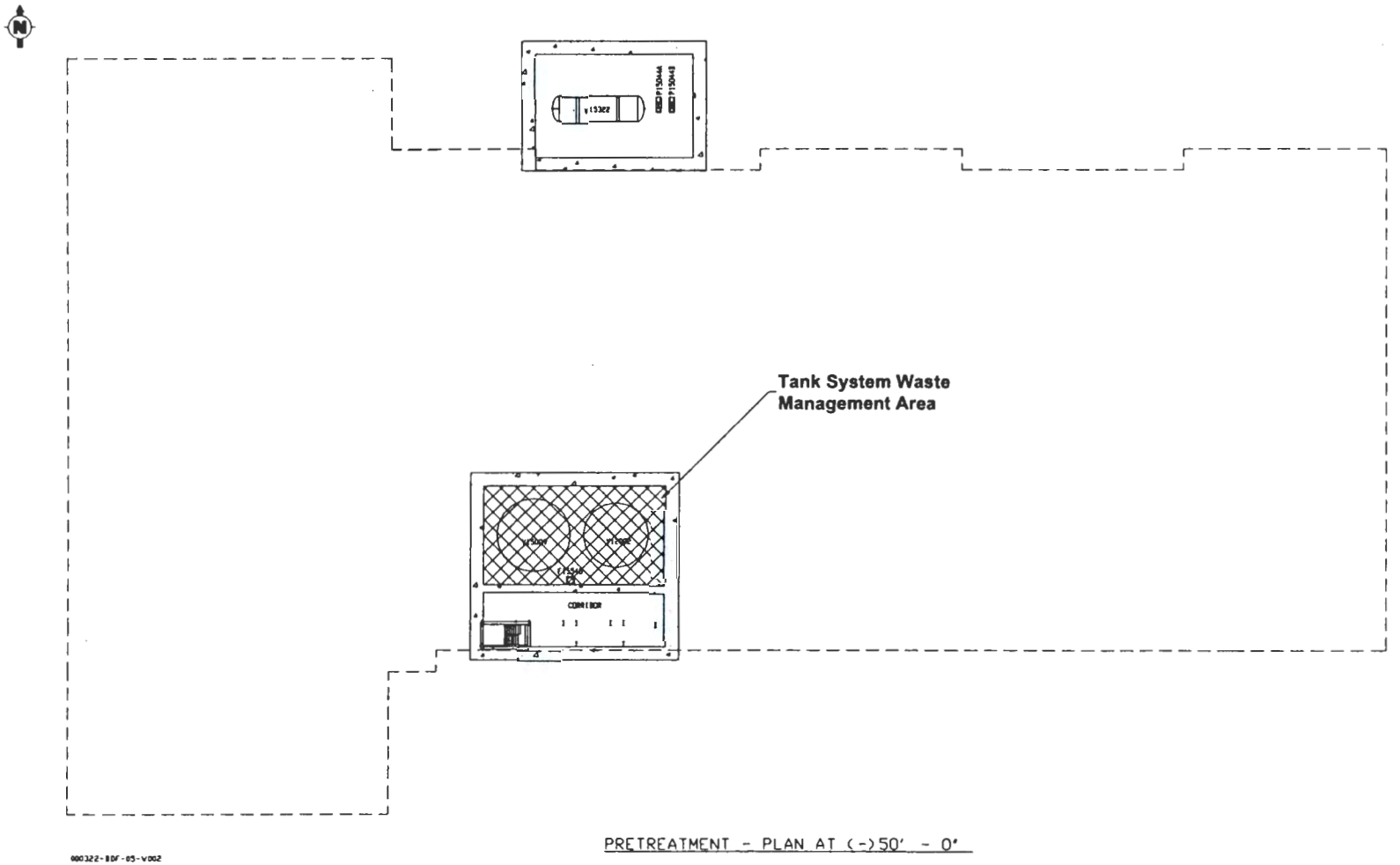
Notes:

1 The floor and four walls in this cell will be fully lined.
2 Height of liner includes additional capacity to account for a 25 year, 24 hour rainfall as required by WAC 173-303-640(4)(e)(i)(B).

Figure 11A-1. Site Layout Showing Stand-Alone Waste Management Units



1 **Figure 11A-2. Pretreatment Plant (Elevation -50')**



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1 **Figure 11A-3. Pretreatment Plant (Elevation 0')**

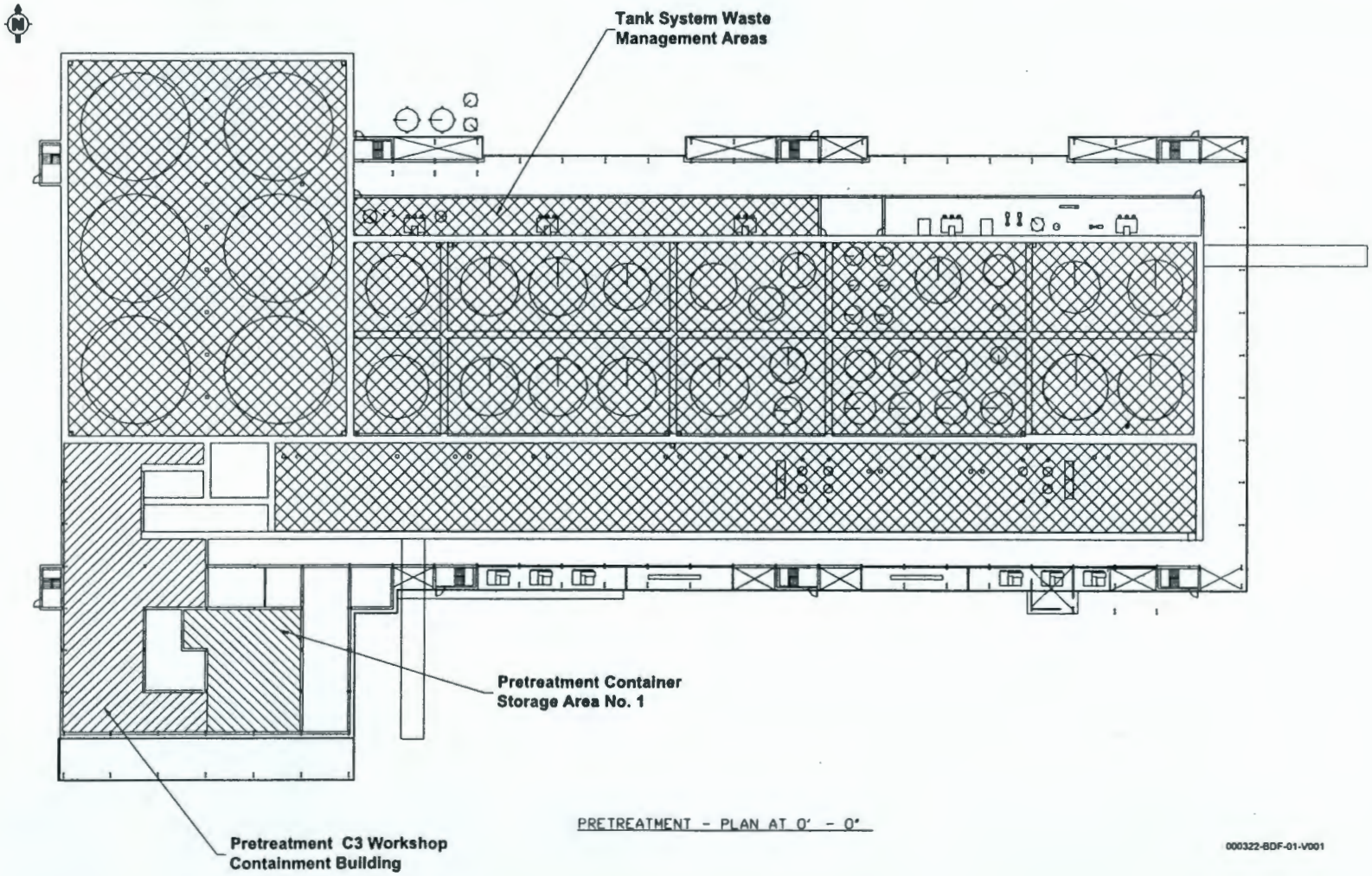

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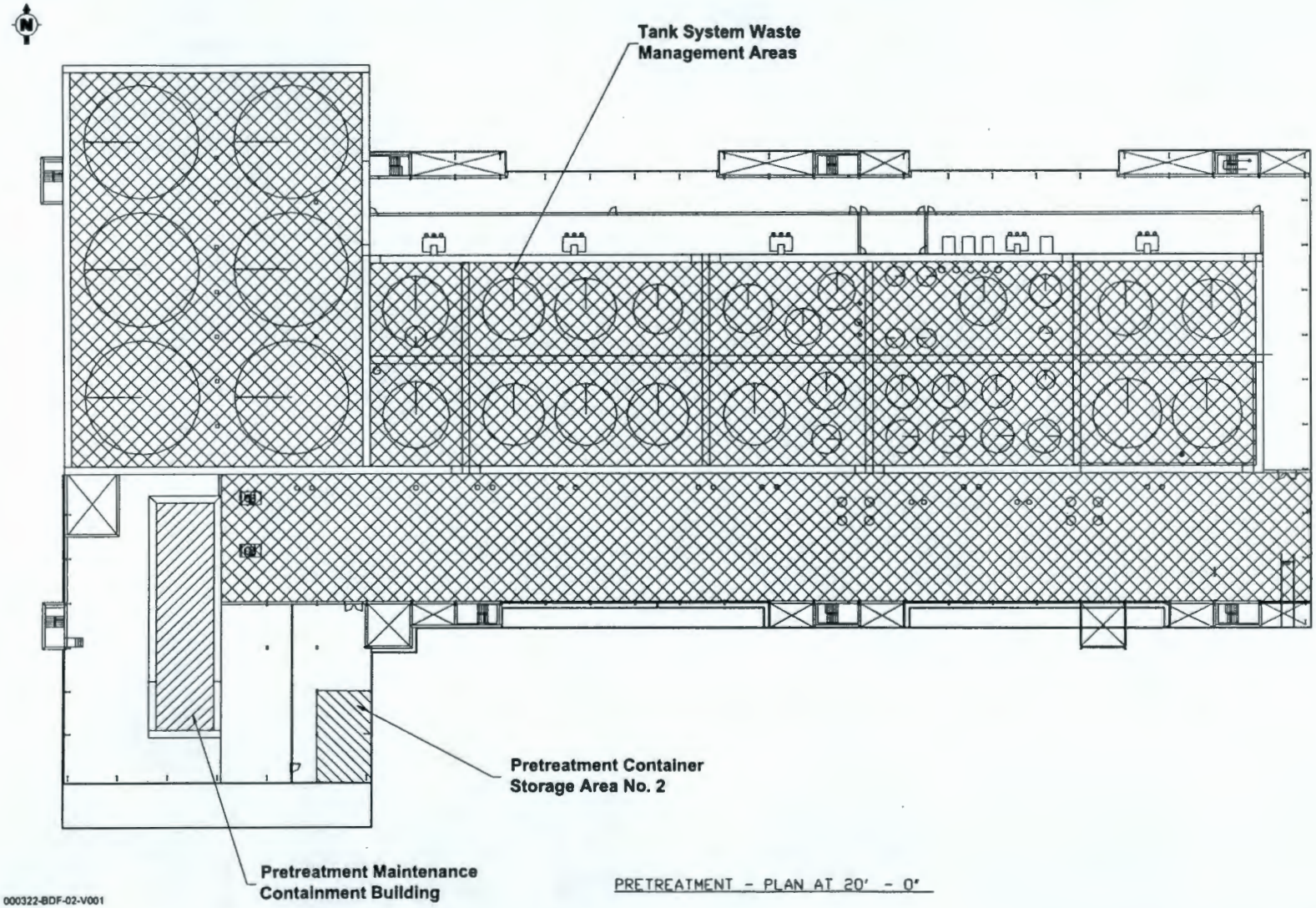
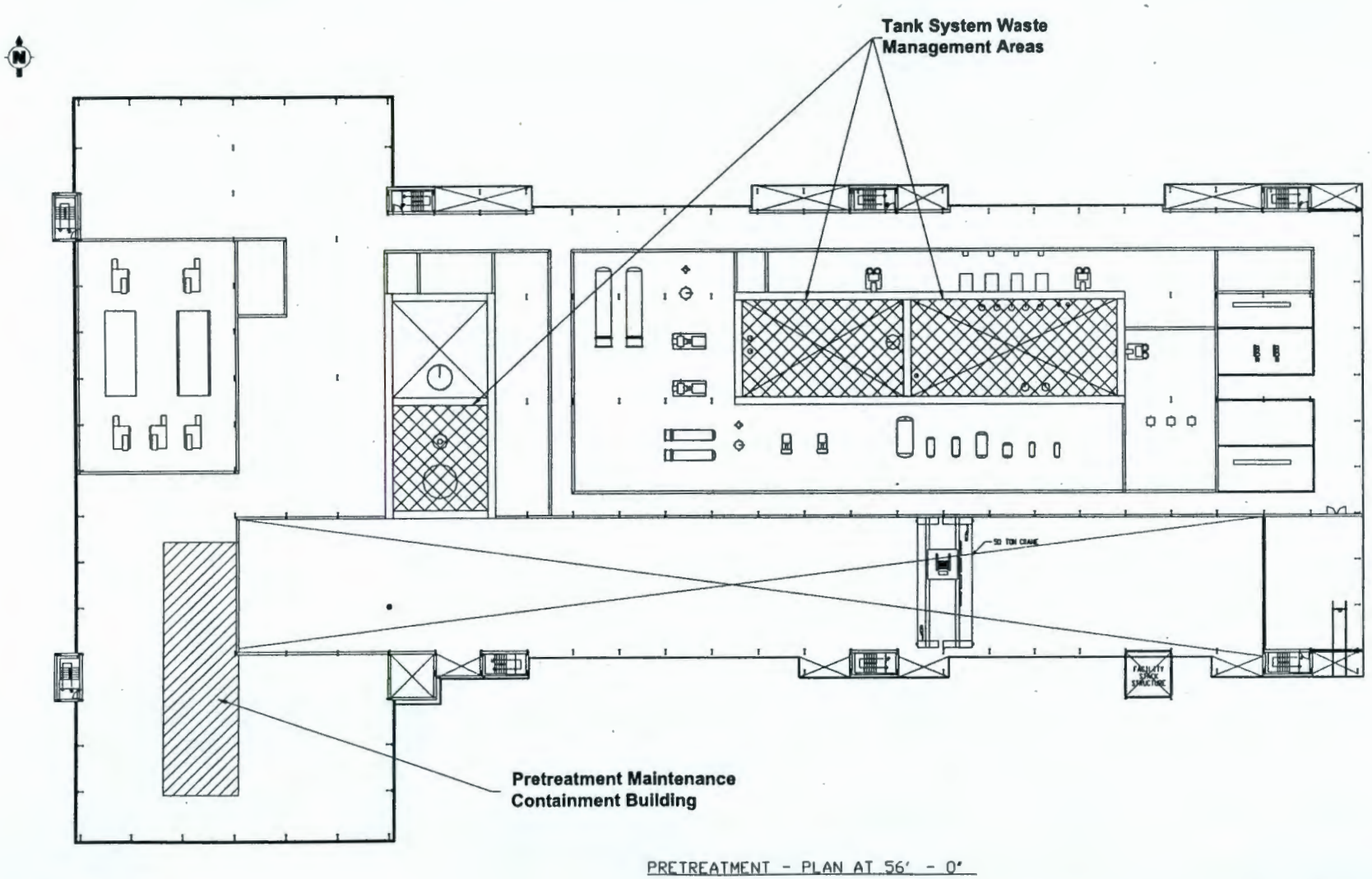
Figure 11A-4. Pretreatment Plant (Elevation 20')



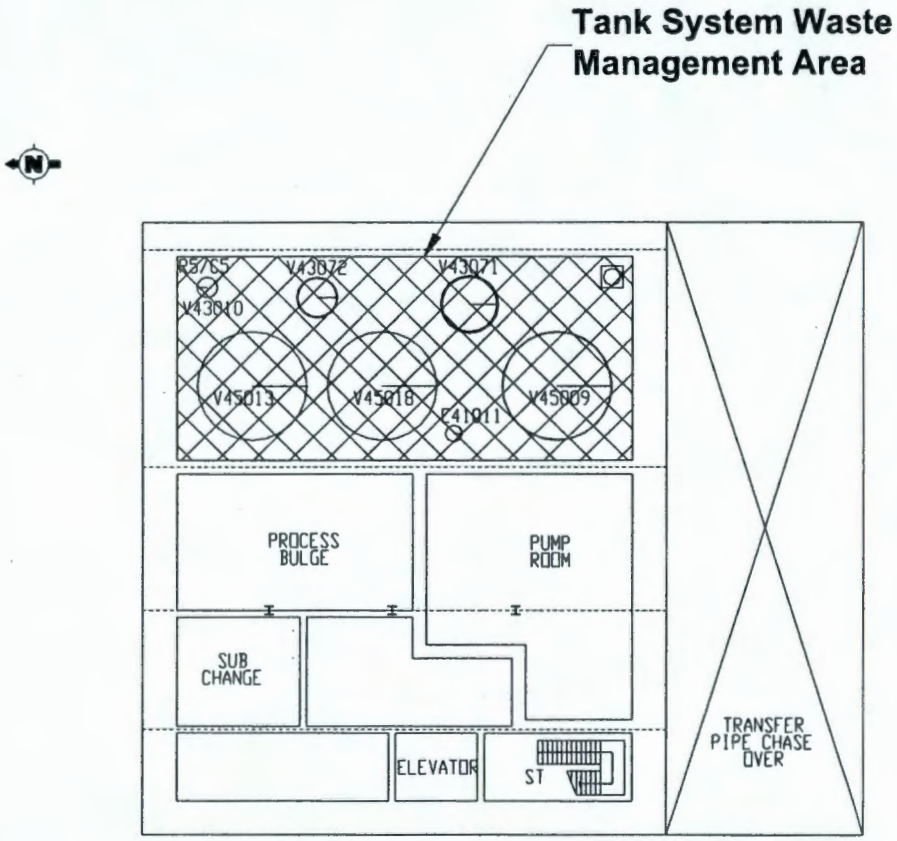
2

1 **Figure 11A-5. Pretreatment Plant (Elevation 56')**



2 000322-BDF-03-V001

1 **Figure 11A-6. LAW Pretreatment Plant (Elevation -30')**



LAW PRETREATMENT - PLAN AT -30' - 0"

000316-BDF-11-V002

2

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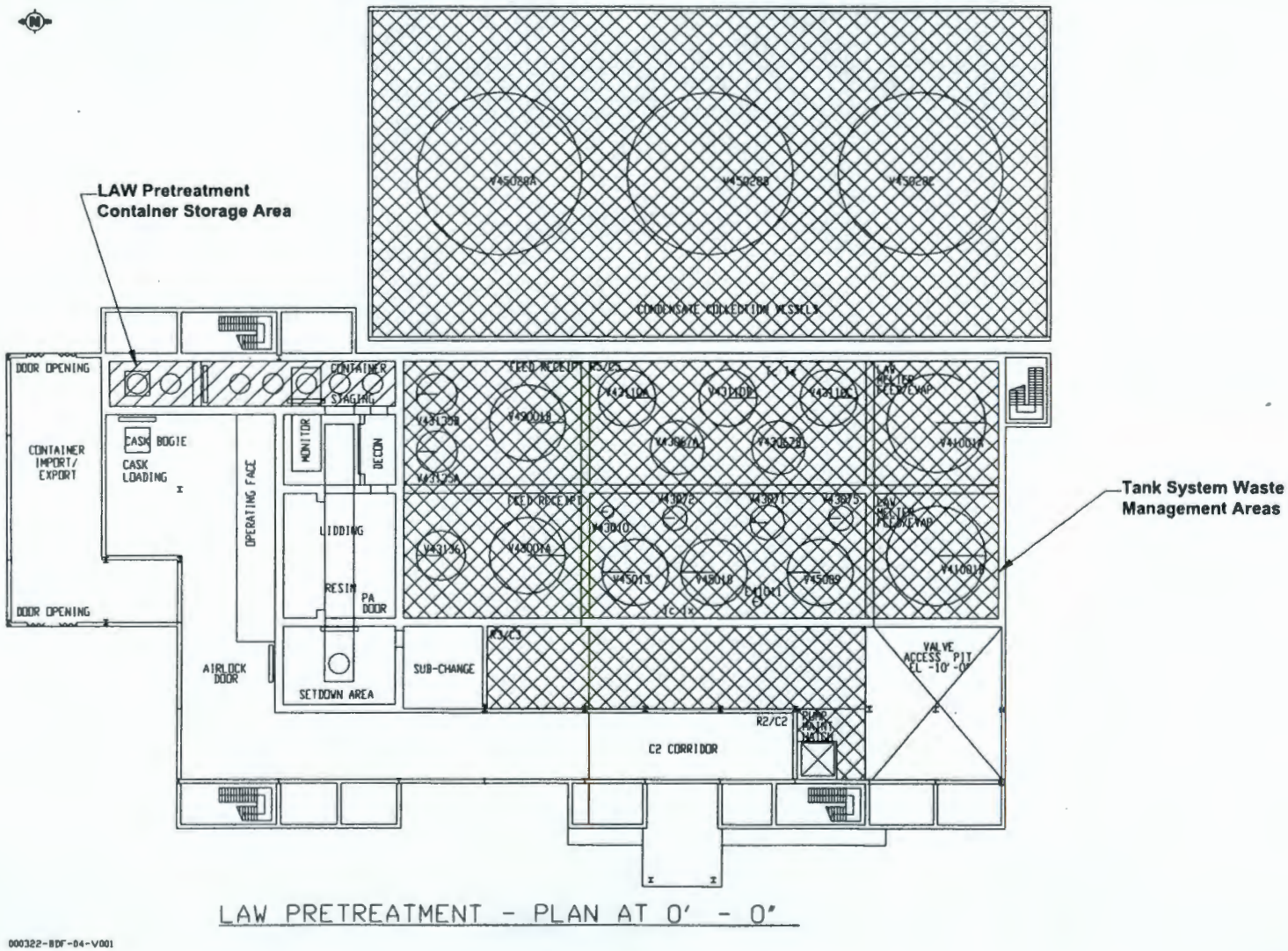
Figure 11A-7. LAW Pretreatment Plant (Elevation 0')



2

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Figure 11A-8. LAW Pretreatment Plant (Elevation 25')

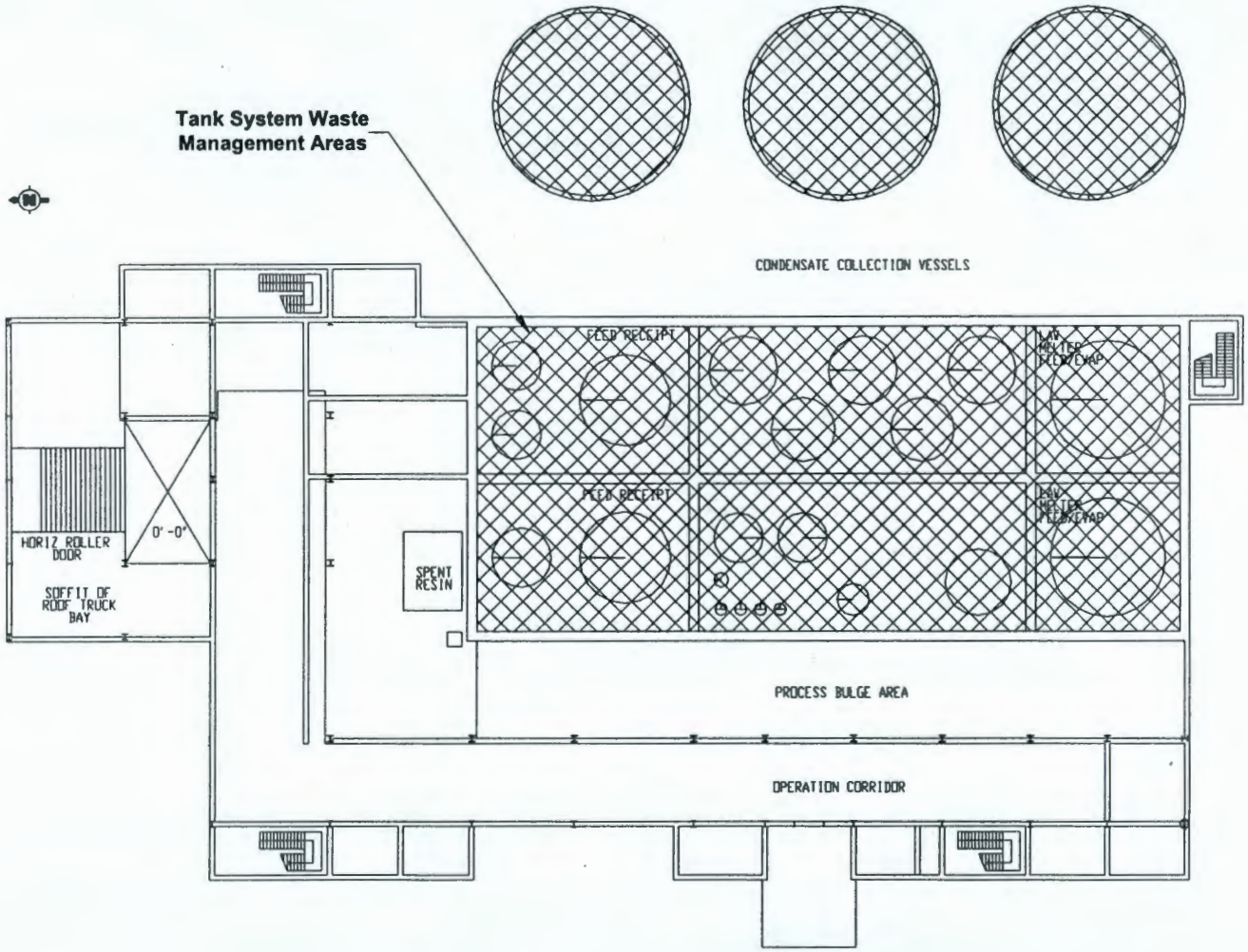

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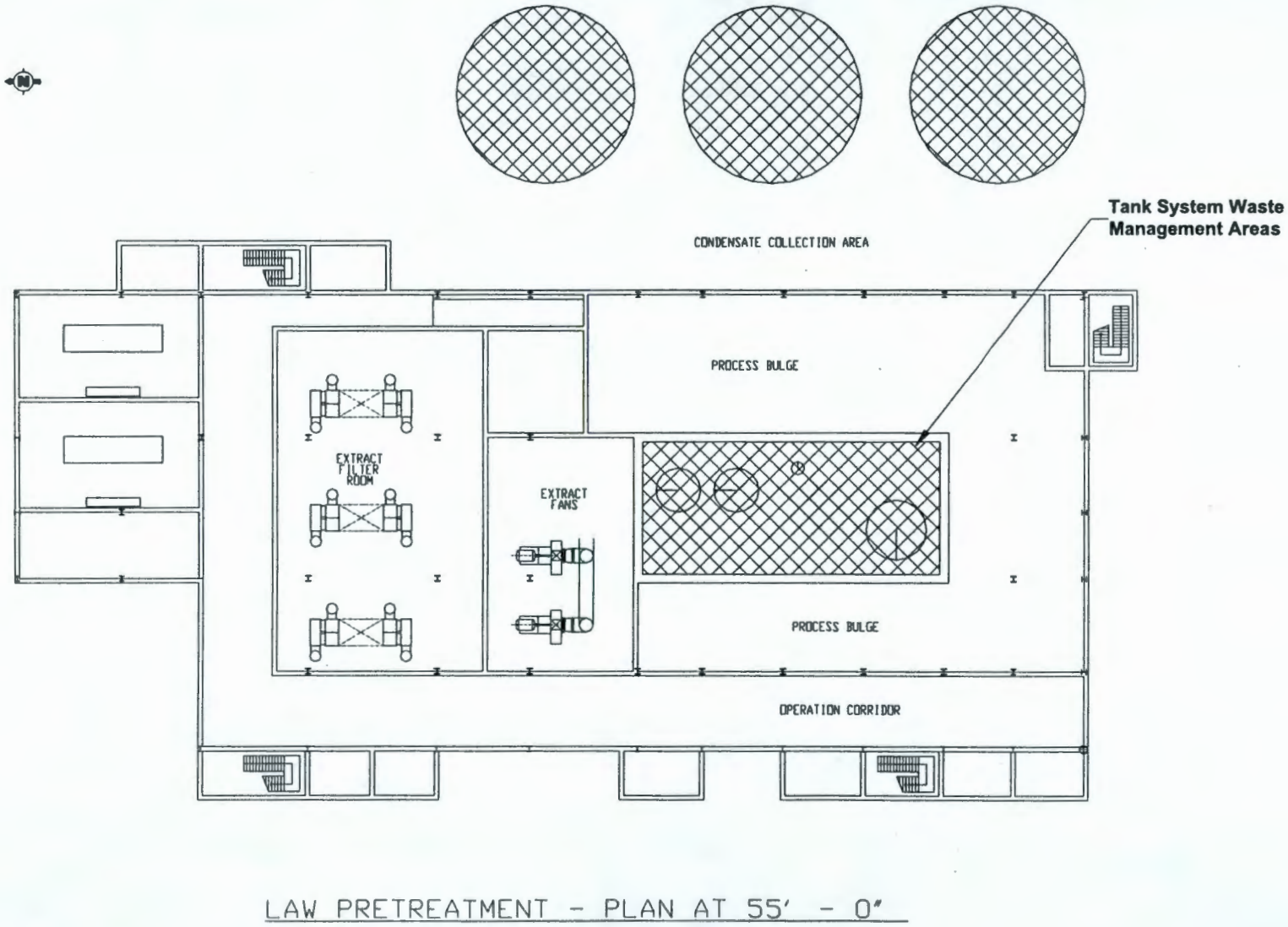
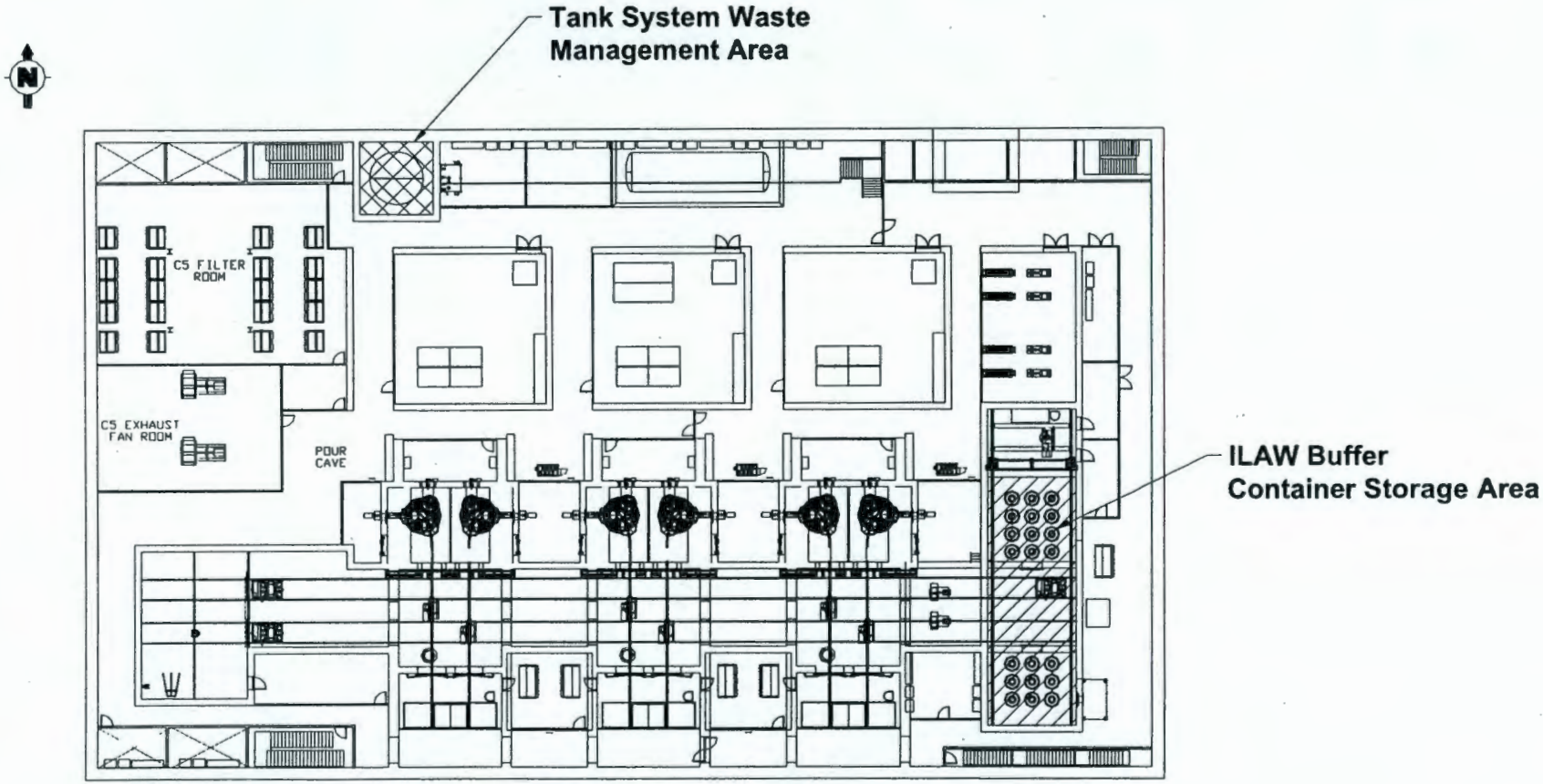
Figure 11A-9. LAW Pretreatment Plant (Elevation 55')



2

000316-BDF-14-V002

1 **Figure 11A-10. LAW Vitrification Plant (Elevation -21')**

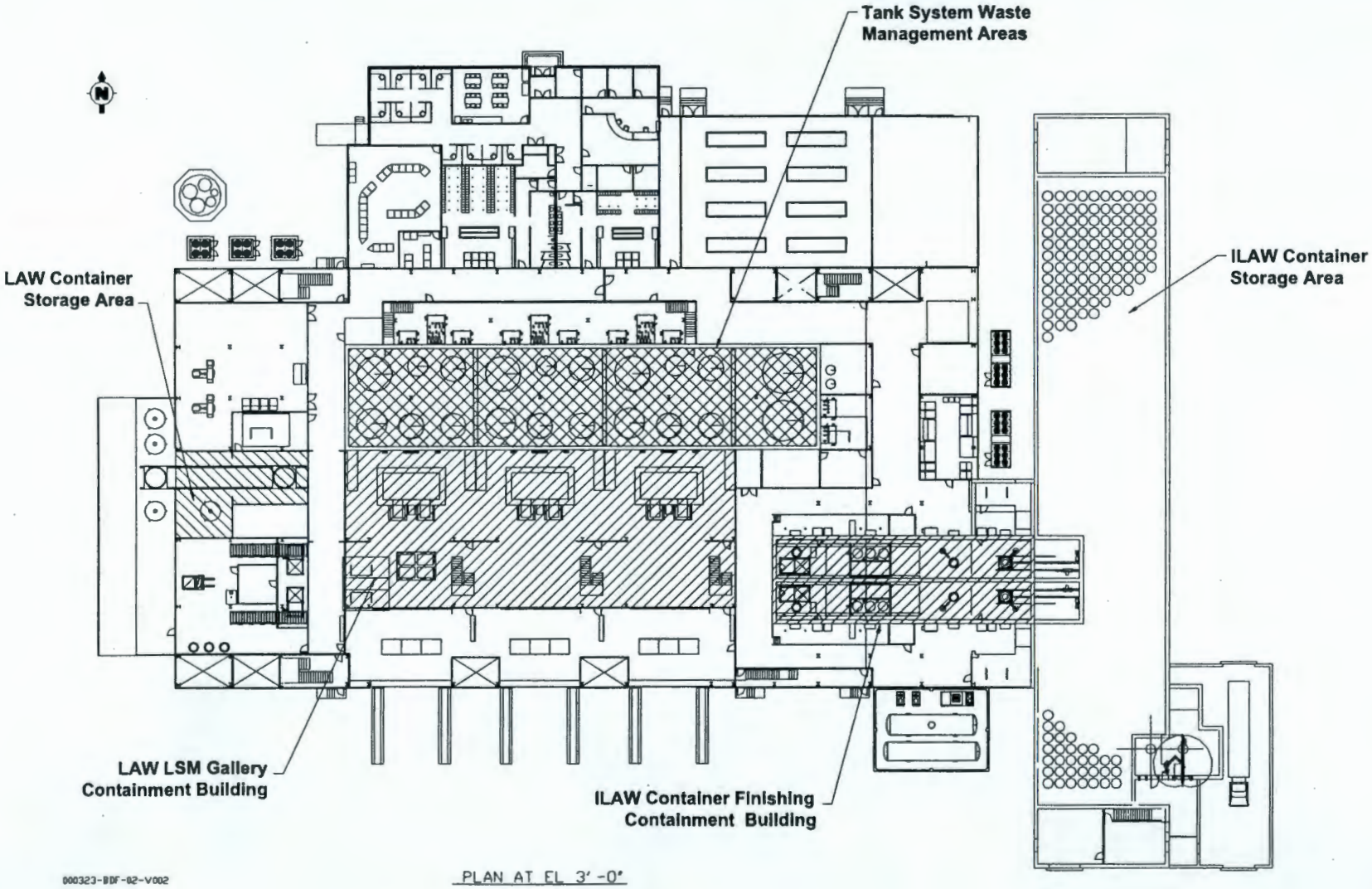


000323-BDF-01-V001

PLAN AT EL (-)21'-0"

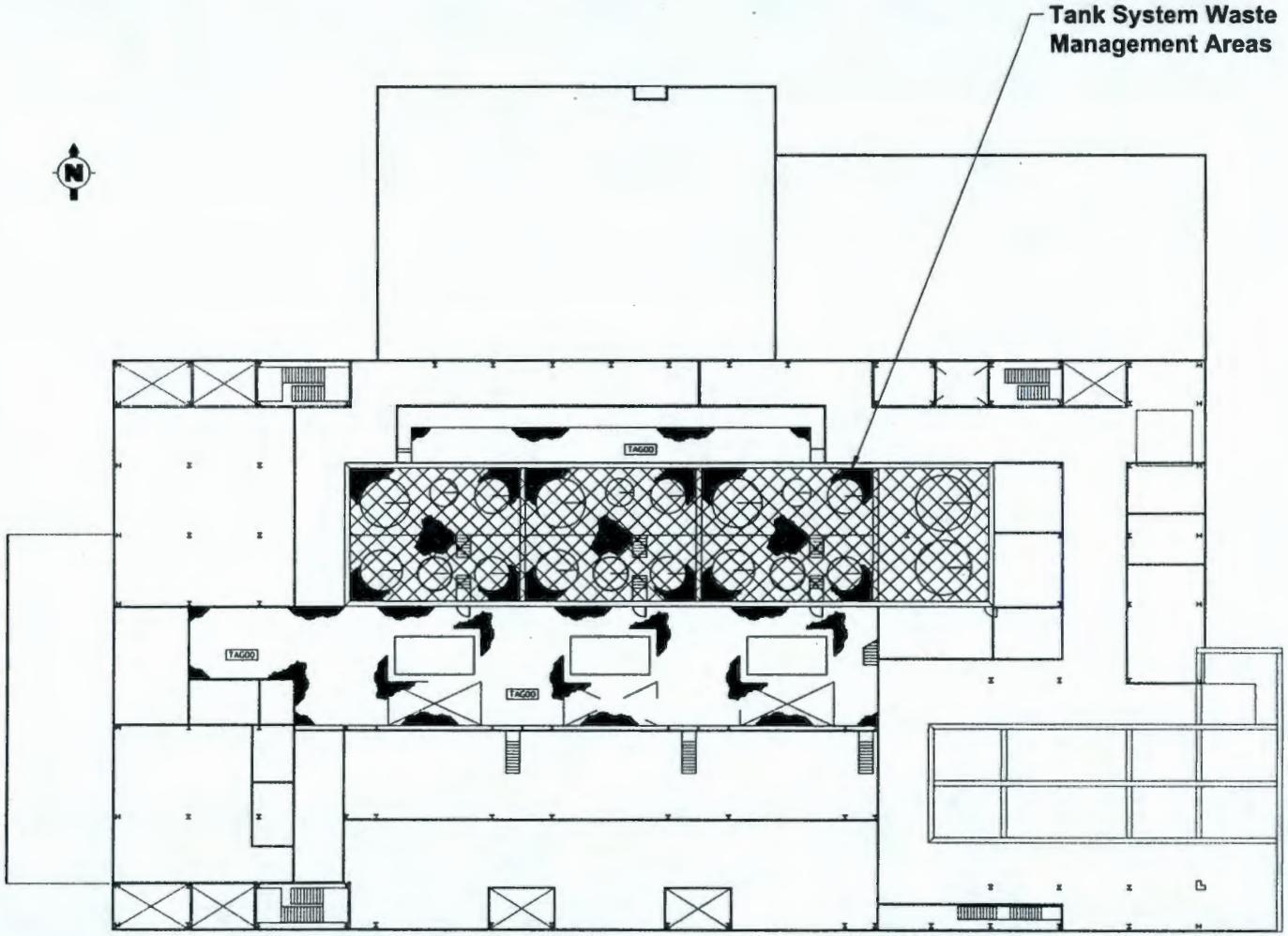
2

1 **Figure 11A-11. LAW Vitrification Plant (Elevation 3')**



2

1 **Figure 11A-12. LAW Vitrification Plant (Elevation 19'-3")**



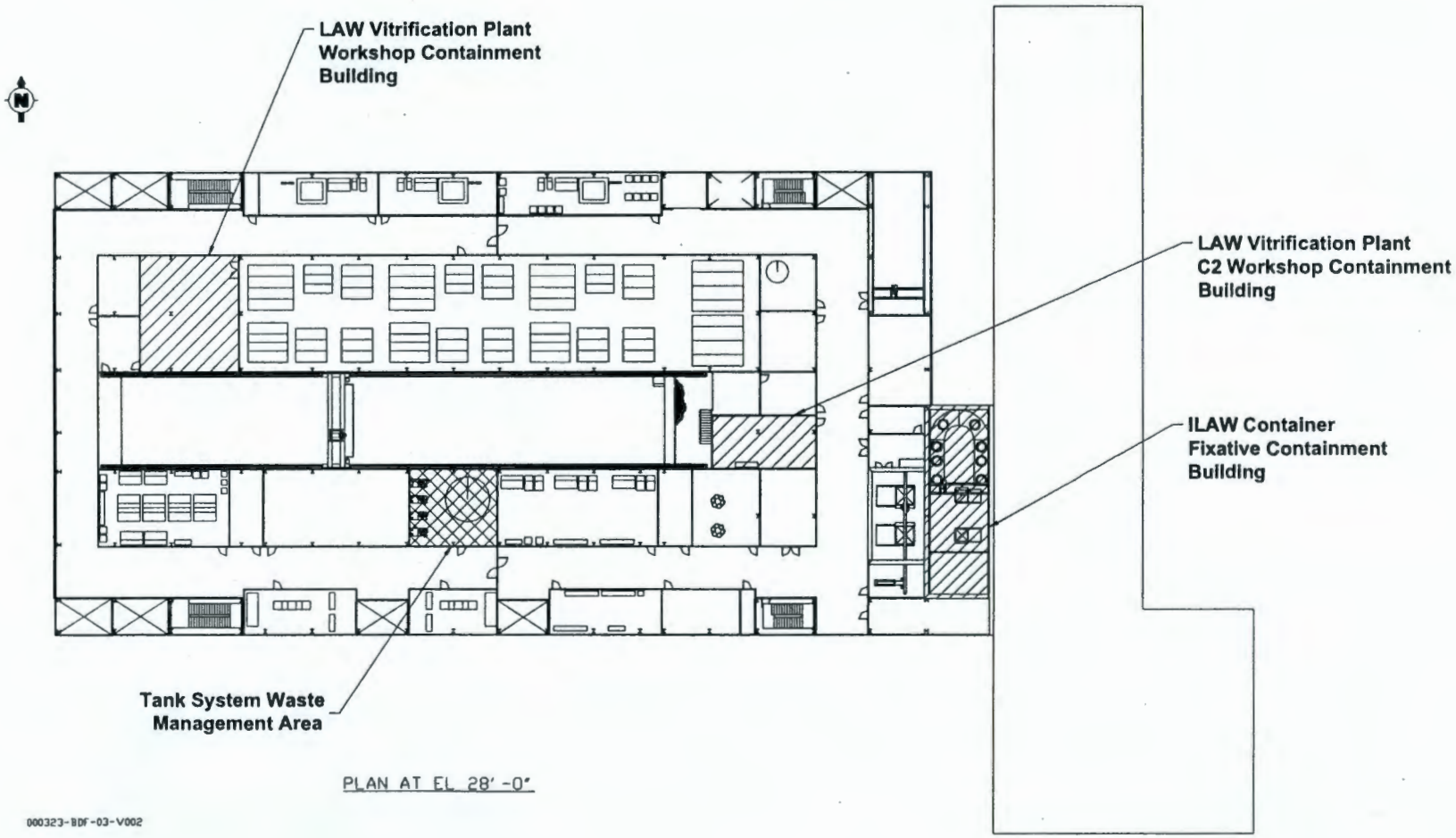
000315-BDF-26-V002

PARTIAL PLAN AT EL 19'-3"

2

1

Figure 11A-13. LAW Vitrification Plant (Elevation 28')



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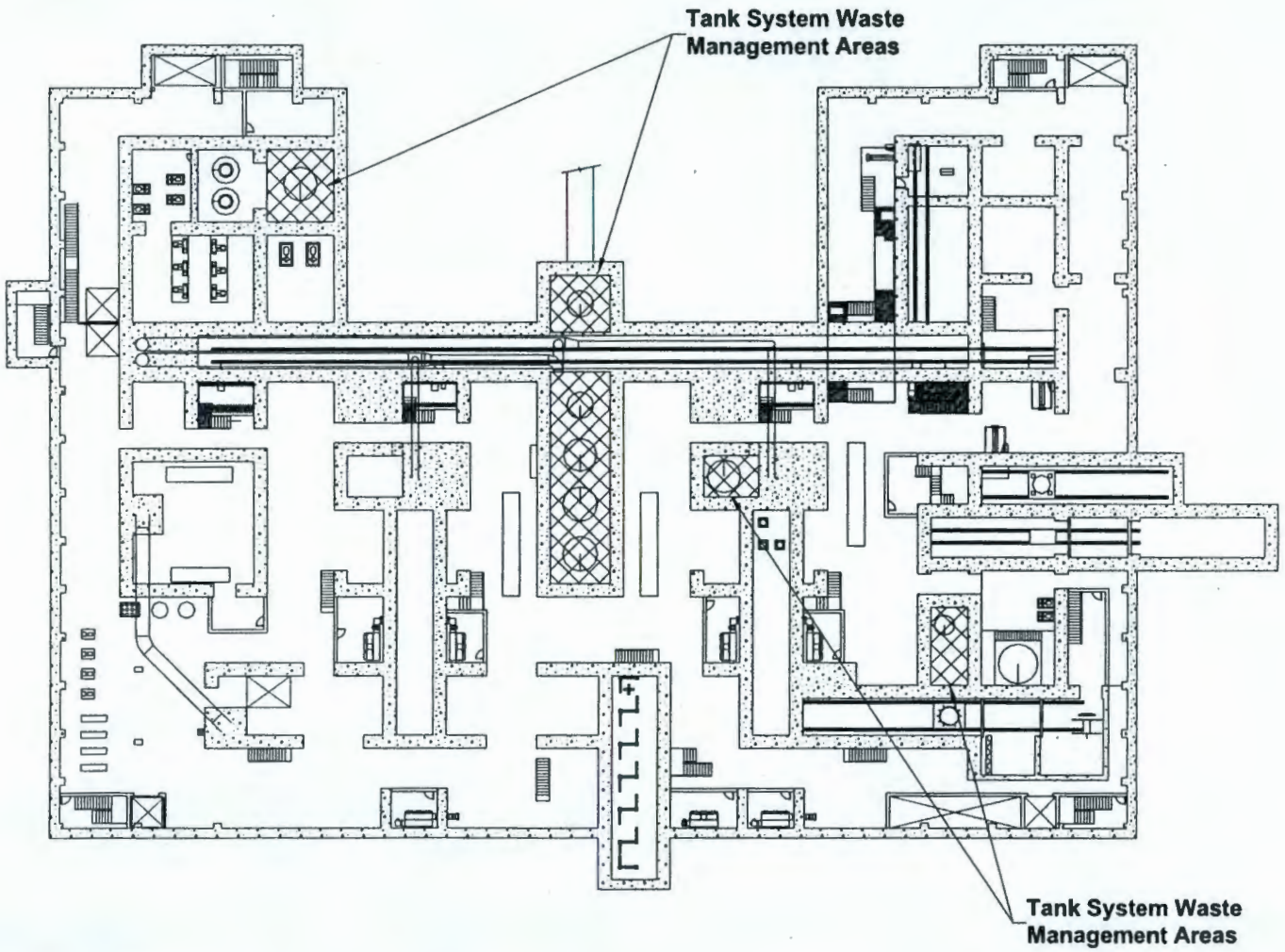
1 **Figure 11A-14. HLW Vitrification Plant (Elevation -16')**



000315-BDF-15-V002

PLAN AT EL. -16'-0"
(FROM EL. -30'-0" TO EL. -9-0")

2

1

Figure 11A-15. HLW Vitrification Plant (Elevation 0')

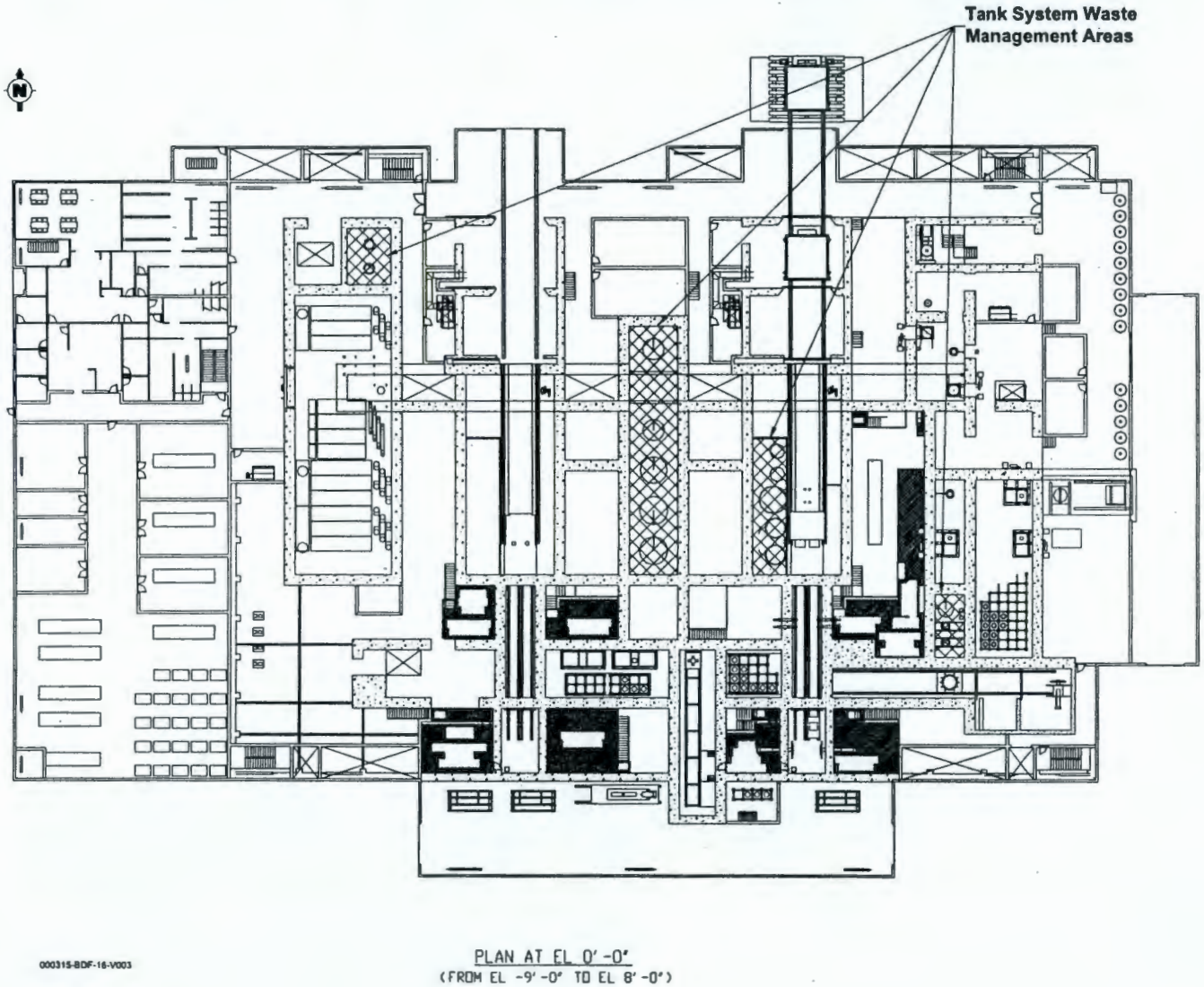


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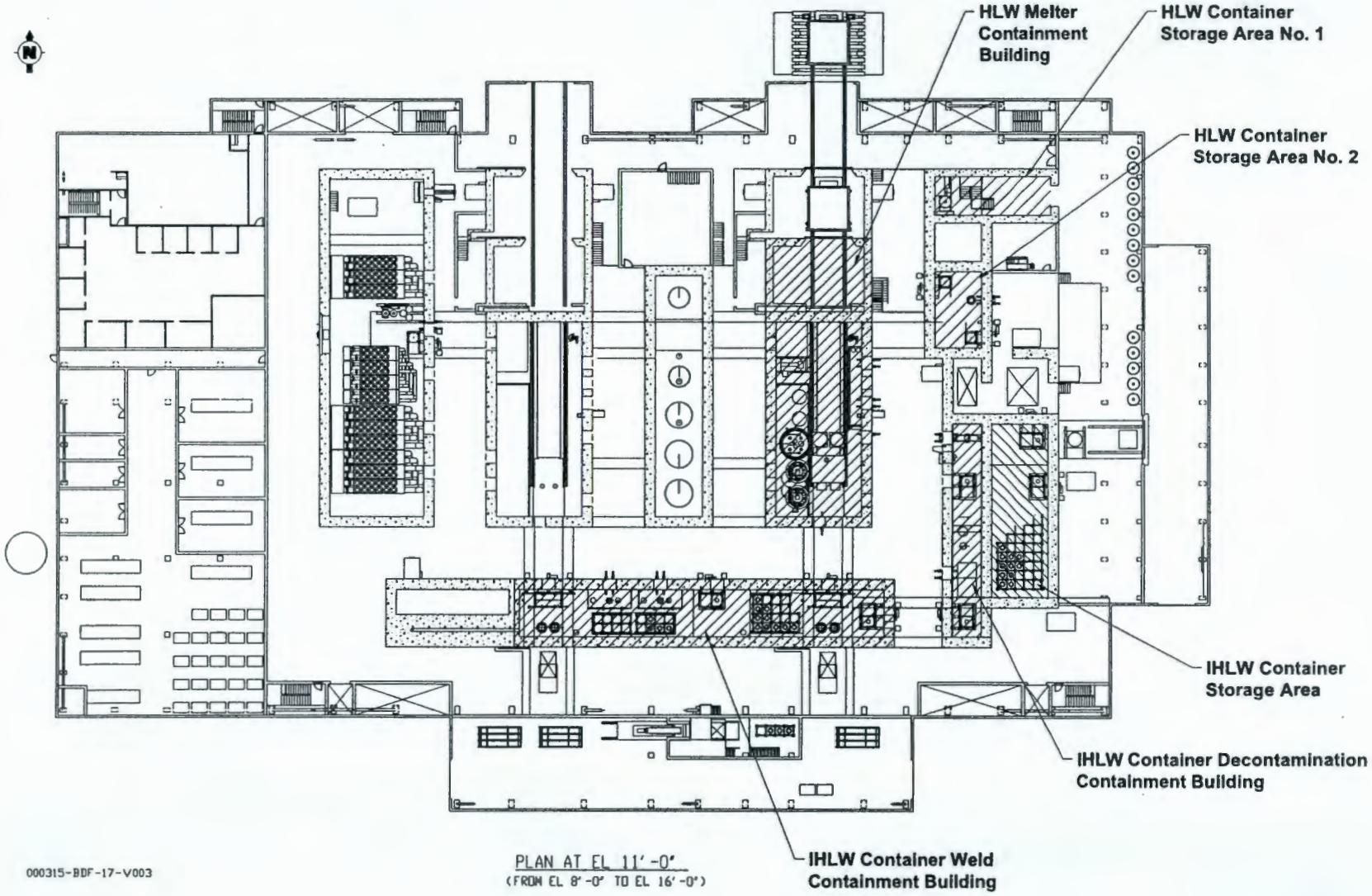
Figure 11A-16. HLW Vitrification Plant (Elevation 11')



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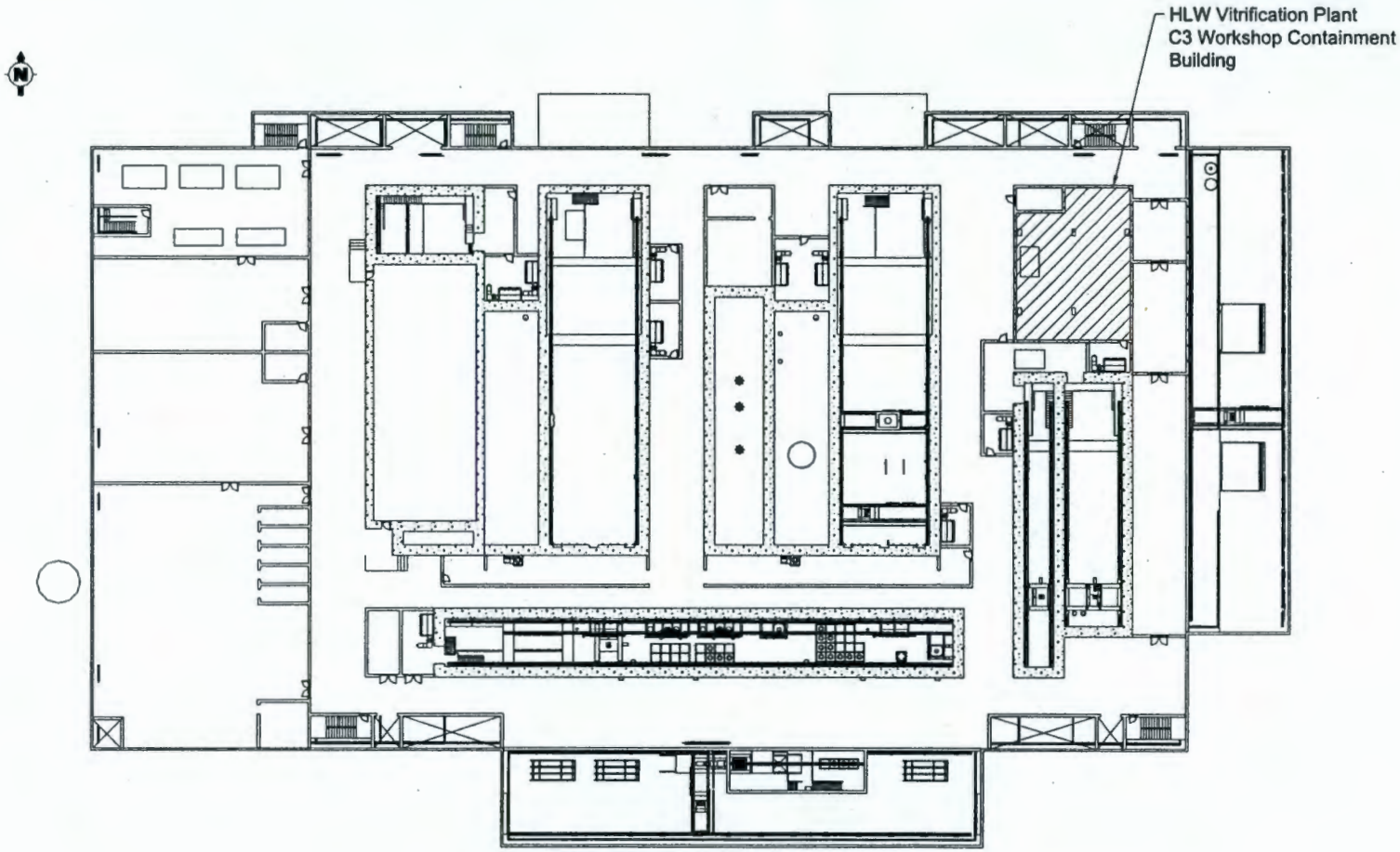
1 **Figure 11A-17. HLW Vitrification Plant (Elevation 30')**



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Supplement 1

Supplement 1
Final Work Plan for Screening Level Risk Assessment for the RPP-WTP

BNFL Inc.

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Contents

Item — Page Number

Acronyms and Abbreviations viii

1. Introduction 1-1
2. Risk Assessment Approach 2-1
3. Engineering Description 3-1
   - 3.1. RPP-WTP Overview 3-1
   - 3.2. Pretreatment 3-2
   - 3.3. LAW Vitrification 3-6
   - 3.4. HLW Vitrification 3-9
   - 3.5. Cascade Ventilation System 3-13
   - 3.6. Fugitive Emissions 3-13
   - 3.7. Upset Conditions 3-14
   - 3.8. Facility Control Philosophy 3-15
4. Screening Level Risk Assessment and Constituents of Potential Concern 4-1
   - 4.1. Preliminary Chemicals of Potential Concern (COPCs) 4-2
   - 4.2. Preliminary Radionuclides of Potential Concern (ROPCs) 4-5
   - 4.3. Selection of Final COPCs/ROPCs for the Quantitative Preliminary Risk Assessment 4-5
   - 4.4. Summary for Identification of COPCs and ROPCs 4-9
5. Quantification of Emissions 5-1
   - 5.1. Emission Sources 5-1
   - 5.2. Emission Assumptions for the Preliminary Risk Assessment 5-1
   - 5.3. Measured Emission Rates for the Final Risk Assessment 5-10
   - 5.4. Uncertainties in Estimating Emission Rates 5-13
   - 5.5. Summary for Quantification of Emissions 5-16
6. Environmental Modeling 6-1
   - 6.1. Air Dispersion Modeling 6-1
   - 6.2. Soil Accumulation Modeling 6-10
   - 6.3. Terrestrial Plant and Animal Modeling 6-12
   - 6.4. Surface Water and Fish Bioaccumulation Modeling 6-16
   - 6.5. Uncertainties 6-21

Contents

Item — Page Number

6.6. Summary for Environmental Modeling 6-23

7. Screening Human Health Risk Assessment 7-1

7.1. Exposure Assessment 7-1

7.2. Toxicity Assessment 7-16

7.3. Risk Characterization 7-28

7.4. Uncertainty Assessment 7-30

7.5. Summary for Screening Human Health Risk Assessment 7-31

8. Screening Ecological Risk Assessment 8-1

8.1. Problem Formulation 8-1

8.2. Exposure Assessment 8-23

8.3. Effects Assessment Calculations 8-48

8.4. Risk Equations 8-53

8.5. Reporting of Major Ecological Risk Findings 8-54

8.6. Uncertainties in Ecological Risk Assessment 8-55

8.7. Summary for Screening Ecological Risk Assessment 8-58

9. Risk-Based Emissions Criteria 9-1

9.1. Human Health Risk-Based Emission Levels 9-1

9.2. Ecological Receptor-based Emissions Levels 9-1

10. Summary 10-1

11. References 11-1

Appendix A Constituents of Potential Concern Lists ..... A-i

Appendix B Chemical-Specific Parameters and Supporting Equations for Human Health Risk Assessment ..... B-i

Appendix C Chemical-Specific Parameters for Ecological Risk Assessment ..... C-i

Appendix D Selection of COPCs and ROPCs for Human Health and Ecological Risk Assessment ..... D-i

Appendix E COPCs and ROPCs for Which There are Emission Rates ..... E-i

Contents

Item | Page Number

FIGURES

Figure 2-1. Overview of Screening Level Risk Assessment Process for RPP-WTP Air Emissions 2-3
Figure 2-2. Overview of Screening Level Risk Assessment Process During the Preliminary Risk Assessment and the Final Risk Assessment for RPP-WTP Air Emissions 2-4
Figure 3-1. Location of the RPP-WTP on the Hanford Site 3-17
Figure 3-2. RPP-WTP Layout 3-18
Figure 3-3. Process Flow Diagram 3-19
Figure 4-1. Selection of Constituents of Potential Concern 4-10
Figure 6-1. Exposure Grids in Each concentric Zone 6-24
Figure 6-2. Sources of COPC and ROPC Concentrations in Soil 6-25
Figure 6-3. Sources of Constituents of Potential Concern Concentration in Plants 6-26
Figure 6-4. Generic Sources of Constituents of Potential Concern Concentrations in Animal Tissue, Eggs, and Dairy Products 6-27
Figure 6-5. Sources of Constituents of Potential Concern Concentrations in Tissue, Eggs, and Dairy Products of Domestic Farm Animals 6-28
Figure 6-6. Sources of Constituents of Potential Concern Concentrations in Tissue of Game Animals 6-29
Figure 6-7. Sources of Constituents of Potential Concern Concentrations in Fish 6-30
Figure 7-1. Human Health Conceptual Exposure Model 7-32
Figure 7-2. Exposure Distances (Far-Field) from the RPP-WTP at the Hanford Site 7-33
Figure 7-3. Exposure Distances (Near-Field) from the RPP-WTP at the Hanford Site 7-34
Figure 7-4 Hanford Site Existing Land Use Map – 1996 7-35
Figure 7-5 Hanford Site Projected Land Use Map – 2046 7-36
Figure 8-1. Ecological Conceptual Exposure Model 8-59
Figure 8-2. Recreation and Wildlife Areas and the Hanford Reach 8-60
Figure 8-3. Vegetation Types of the Hanford Site 8-61
Figure 8-4. Selected Raptor Nesting and Perching Locations on the Hanford Site 8-62
Figure 8-5. RPP-WTP Areas Vegetation Types (Simplified) 8-63
Figure 8-6. Fall Chinook Salmon Spawning Areas Along the Columbia River 8-64
Figure 8-7. Trophic Levels and Receptor Species Considered in Development of the 200 Area and Vicinity Terrestrial Conceptual Exposure Model 8-65
Figure 8-8. Trophic Levels and Receptor Species at the Columbia River Considered in Development of the 200 Area and Vicinity Aquatic Conceptual Exposure Model 8-66
Figure 8-9. Trophic Levels and Selected Receptor Species (names in bold) from the 200 Area and Vicinity Terrestrial Conceptual Exposure Model 8-67
Figure 8-10. Trophic Levels and Selected Receptor Species (names in bold) at the Columbia River Considered in Development of the 200 Area and Vicinity Aquatic Conceptual Exposure Model 8-68
Figure 8-11. Relationship Between Sources and Biotransfer Factors for Calculating Terrestrial and Aquatic Exposures 8-69

Contents

Item | Page Number

TABLES

Table 4-1. Human Health Chemical Toxicity Values for Organic Constituents of Potential Concern 4-11
Table 4-2. Human Health Toxicity Values for Inorganic Constituents of Potential Concern 4-23
Table 4-3. Human Health Toxicity Values for Radionuclides of Potential Concern 4-25
Table 4-4. Acute Inhalation Exposure Criteria for COPCs 4-27
Table 6-1. Specific Variables for Plant Uptake Modeling[1] 6-31
Table 6-2. Specific Variables of Uptake into Animal Products[a] 6-32
Table 7-1 Exposure Scenarios 7-37
Table 7-2 Exposure Parameters for Residential Scenarios 7-40
Table 7-3 Summary of Exposure Parameters for Native American Subsistence Scenarios[a] 7-46
Table 7-4 Summary of Exposure Parameters for Hanford Site Worker Scenario 7-53
Table 8-1. Policy Goals, Ecological Assessment Endpoints, Measures, and Decision Rules for 200 Areas and Surroundings 8-70
Table 8-2. Soil Ingestion Rates For Hanford Receptors 8-74
Table 8-3. Derivation of Soil-to-Body Weight Ratios for Prey of Hanford Receptors 8-75
Table 8-4. Derivation of Indirect Soil Ingestion Rate for Hanford Receptors 8-76
Table 8-5 Toxicity Equivalence Factors for Chlorinated Dioxins, Chlorinated Dibenzofurans, and PCBs[a] 8-77

Acronyms and Abbreviations

ADD	average daily dose
AE	absorption efficiency
AIEC	acute inhalation exposure criteria
ALI	annual limit on intake
APCS	air pollution control system
ASIL	acceptance source impact levels
AT	averaging time
ATSDR	Agency for Toxic Substances and Disease Registry
AUF	area-use factor
BAF	bioaccumulation factor
BAF-S	soil-to-tissue transfer factor
BAF-T	tissue-to-tissue transfer factor
BAS-F	sediment to tissue uptake factor
BCF	bioconcentration factors
BPIP	Building Profile Input Program
BSF	sediment-to-tissue uptake factor
BTU	British Thermal Unit
CAA	*Clean Air Act*
CAS	Chemical Abstract Service
CETRED	Combustion Emissions Technical Resource Document
COPC	constituent of potential concern and chemicals of potential concern
DEHP	bis(2-ethylhexyl)phthalate
DF	decontamination factors
DNA	deoxyribonucleic acid
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
DQO	Data Quality Objective
DRE	destruction and removal efficiency
DSCM	dry standard cubic meter
DST	double-shell tank
Ecology	Washington State Department of Ecology
ED	duration of exposure
EDL	estimated detection limit
EF	exposure frequency
EPA	U.S. Environmental Protection Agency
ERA	ecological risk assessment
ESU	evolutionarily significant units
FEALE	Fitzner-Eberhardt Arid Lands Ecology Reserve
FRA	final risk assessment
HAMMER	Hazardous Materials Management and Emergency Response
HAP	hazardous air pollutants
HAZWRAP	Hazardous Waste Remedial Actions Program
HEAST	Health Effects Assessment Summary Tables
HEME	high efficiency mist eliminator
HEPA	high efficiency particulate air
HHRA	human health risk assessment
HI	hazard index

Acronyms and Abbreviations

HLW	high-level waste
HQ	hazard quotient
IAEA	International Atomic Energy Agency
IHLW	immobilized high-level waste
ILAW	immobilized low-activity waste
IRIS	Integrated Risk Information System
ISCST3	Industrial Source Complex Short Term Model, Version 3
K_{ow}	octanol/water partition coefficient
LADD	lifetime average daily dose
LAW	low-activity waste
LIGO	Laser Interferometer Gravitational Wave Observatory
LOAEL	lowest-observed adverse effect level
MACT	Maximum Achievable Control Technology
MDL	method detection limit
MF	metabolism factor
MPRM	Meteorological Processor for Regulatory Models
MSL	mean sea level
MW	molecular weight
NAAQS	National Ambient Air Quality Standard
NaOH	sodium hyrdoxide
NAWQC	National Ambient Water Quality Criteria
NCEA	National Center for Environmental Assessment
NOAEL	no-observed adverse effect level
NWS	National Weather Surface
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCDD	polychlorinated dibenzo-p-dioxin
PCDF	polychlorinated dibenzofuran
PIC	product of incomplete combustion
PM_{10}	particulates less than 10 microns in diameter
PODC	principal organic dangerous constituent
PRA	preliminary risk assessment
RDL	reported detection limit
RfC	reference concentration
RfD	reference dose
RFD	reverse flow diverters
RME	reasonable maximum exposure
RMP	risk management program
RPF	relative potency factor
RPP-WTP	River Protection Project - Waste Treatment Plant
SBS	submerged bed scrubber
SCR	selective catalytic reduction
SLRA	screening level risk assessment
SO_x	sulfur oxide
SP	slope factor
SP	soil-to-plant transfer factor
SRE	system removal efficiency

Acronyms and Abbreviations

SVOC	semi-volatile organic compound
T&E	threatened and endangered
TEF	toxicity equivalency factor
TEQ	toxicity equivalent
TIC	tentatively identified compound
TNC	The Nature Conservancy
TOC	total organic carbon
TOE	total organic emission
TRU	transuranic
TRV	toxicity reference value
TSD	treatment, storage, or disposal
TUF	temporal-use factor
TWINS	Tank Waste Information Network System
TWRS	Tank Waste Remediation System
UHC	Underlying Hazardous Constituents
UR	unit risk
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
VSL	Vitreous State Laboratory
WDFW	Washington Department of Fish and Wildlife
WESP	wet electrostatic precipitator
Work Plan	*Final Work Plan for Screening Level Risk Assessment for the RPP-WTP*
WPPSS	Washington Public Power Supply System

Chapter 1

1. Introduction

This document presents the risk assessment work plan (hereafter referred to as the Work Plan). The Work Plan addresses the risk assessment protocol for assessing risk to human health and the environment for the River Protection Project - Waste Treatment Plant (RPP-WTP) at the Hanford Site. The Hanford Site is located in southeastern Washington state, owned by the US Government, and operated by the US Department of Energy (DOE). The proposed facility will include two waste melter and vitrification facilities as well as pretreatment and offgas systems, and will be built in the 200 East Area of the Hanford Site.

The Work Plan establishes the criteria and methodology for conducting a risk assessment to identify potential human health and ecological risks associated with processing Hanford tank waste into a stable glassified form. This risk assessment will be used to establish waste feed acceptance limits as necessary to meet defined risk limits of operation of the RPP-WTP goals.

The Work Plan provides a description of key components that will be used in the screening level risk assessment (SLRA). The emphasis of the work is aerial dispersion of emissions and the potential for risk to human and ecological receptors.

The Work Plan contains a brief statement of the risk assessment approach (section 2) and an engineering description of the RPP-WTP (section 3). Sections 4-8 present the steps involved in both the human health and ecological screening risk assessments including the following:

- Identification of constituents of potential concern (COPCs) – section 4
- Quantification of airborne emissions – section 5
- Environmental modeling of the dispersed airborne emissions – section 6
- Screening human health risk assessment – section 7
- Screening ecological risk assessment –section 8.

Section 9 presents the methodology for establishing risk-based emissions criteria. Section 10 summarizes each area of the screening level risk assessment (SLRA). References are included in section 11 and are followed by data appendices A, B, C, D, and E.

Chapter 2

2. Risk Assessment Approach

This section describes the overall programmatic screening level risk assessment (SLRA) approach (Figure 2-1) that will be used to support the *RPP-WTP Dangerous Waste Permit Application* (BNFL 1999a). The primary regulatory guidance followed for this assessment is *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (EPA 1998a). The major components of the SLRA process for airborne emissions will include the following:

- Work Plan for the SLRA – This Work Plan is submitted with the Dangerous Waste Permit Application and establishes the methodology for the future implementation of the SLRA. The preliminary risk assessment (PRA) and final risk assessment (FRA) are subparts of the SLRA, as described in the Work Plan.

- Preliminary risk assessment – The PRA will be performed while the Dangerous Waste Permit Application is being reviewed and before final approval of the permit.

- Final risk assessment – The scope of the FRA will be similar to the PRA. However, modeled emission rates will be replaced with the results of the environmental performance demonstration.

The PRA and FRA will address the potential operating life of the facility. The current Dangerous Waste Permit Application covers operations through the year 2018. However, the SLRA will initially assume the facility will operate at maximum capacity for the entire design life of the facility (40 years). This assumption will result in the SLRA addressing more than the portion of the total radioactivity (25 percent) and volume (10 percent) of Hanford tank waste that will be treated during the first stage of the RPP-WTP pretreatment and vitrification process. Risk from the remaining waste as well as cumulative risk from the Hanford Site, are outside the scope of the SLRA. Only 25 percent and 10 percent volumes are to be treated first. The general technical procedure for the SLRA is provided in Figure 2-2.

The Work Plan focuses on the PRA because it must be completed before issuance of the Dangerous Waste Permit (BNFL 1999a). The FRA will be performed when the results of the environmental performance demonstration become available. Based on the results of the environmental performance demonstration, the FRA may involve rerunning models, modeling additional chemicals, or changing model parameters. Information that may be updated in the FRA includes:

- toxicity data based on reevaluation of toxicity data sources identified in the work plan
- addition of compounds newly identified during the environmental performance demonstration
- emission rates updated based on environmental performance demonstration results
- stack gas parameters (i.e., flow rates, temperatures) updated based on environmental performance demonstration
- receptor locations based on land use changes, if any
- and address any errors in the PRA

The FRA reruns may also be dictated by the findings of the PRA.

As described in section 7, Screening Human Health Risk Assessment, and Section 4, Constituents of Potential Concern, there will be two exposure scenarios: worst-case exposures and plausible exposures.

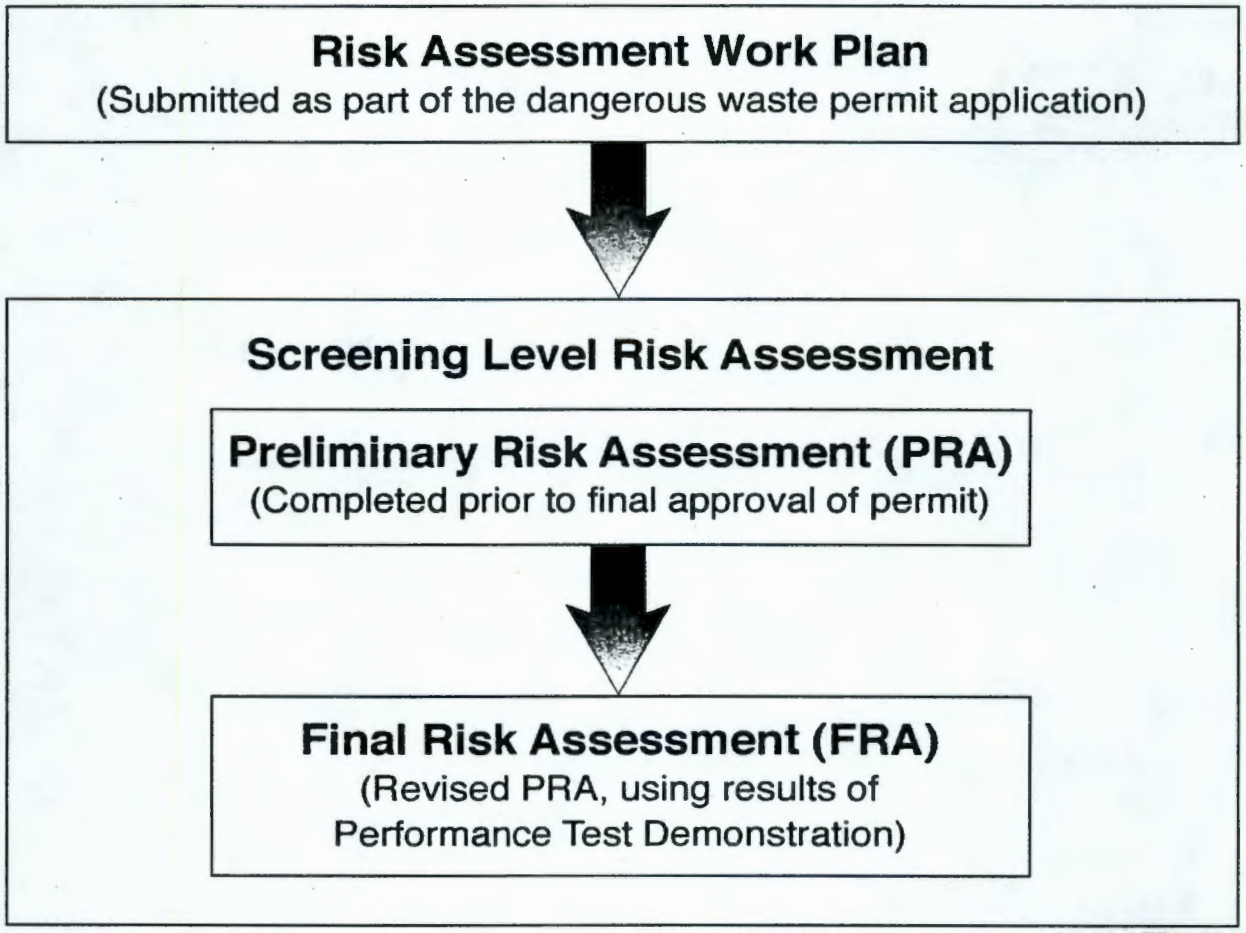
The primary difference between these scenarios is the assumed location of the receptor populations. For the worst-case scenarios, receptor populations are assumed to be present at the location where emission concentrations are estimated to be greatest regardless of the likelihood of their presence. For the plausible scenarios, receptors are assumed to be located in areas where similar receptors are currently present or may be expected in the future. The scenarios are intended to provide a better understanding of the range of potential risks to human and ecological receptors under any land use condition at various points in time.

This approach is consistent with the *Environmental Protection Agency Risk Characterization Policy* (EPA 1995c) which directs the "use of several descriptors, rather than a single description, to enable the Environmental Protection Agency (EPA) to present a fuller picture of risk that corresponds to the range of different exposure conditions encountered by various individuals and populations."

Participants in the SLRA process are:

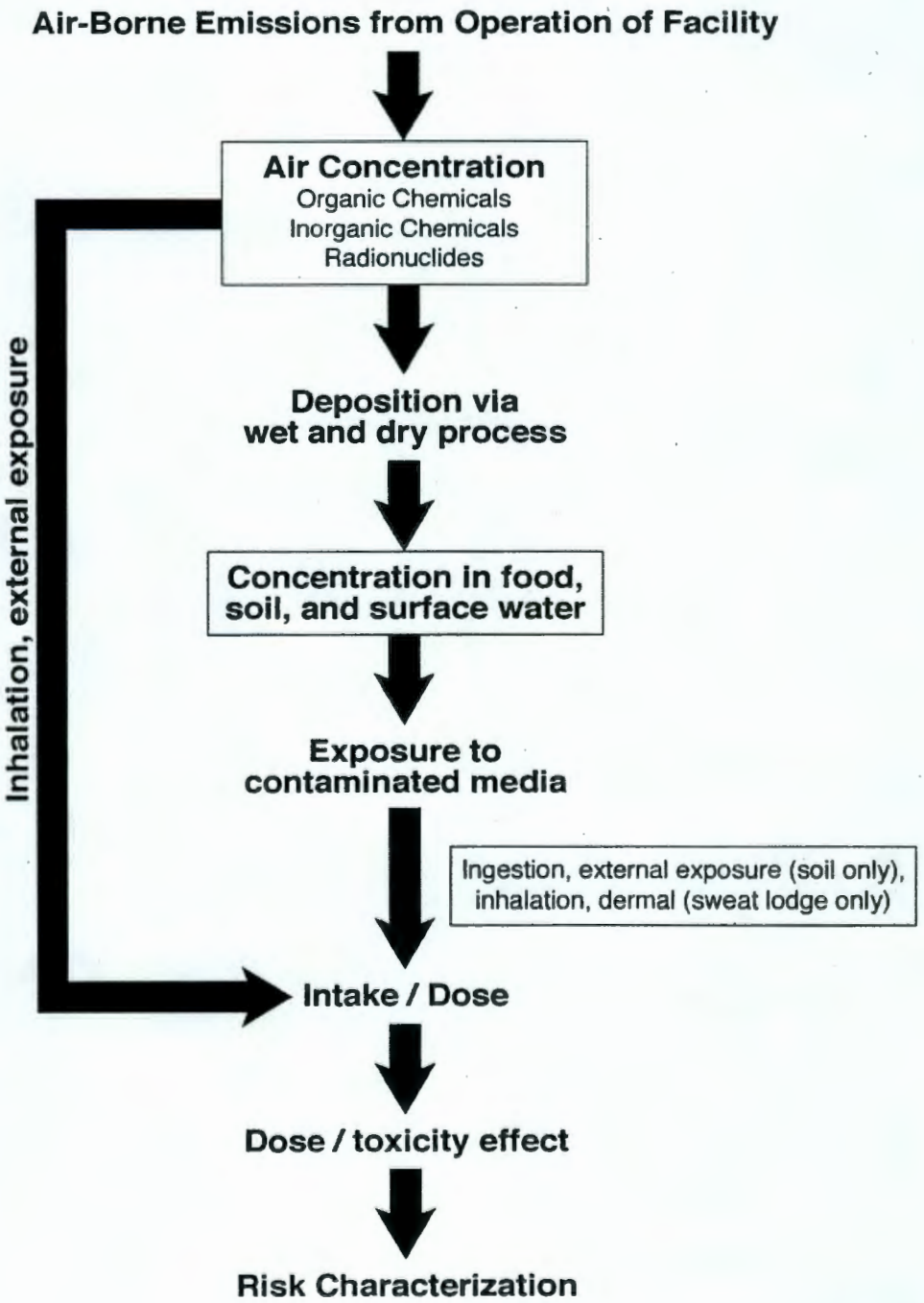
- BNFL Inc.
- US Department of Energy
- Washington State Department of Ecology (Ecology)
- EPA Region X
- Yakama Nation
- Confederated Tribes of the Umatilla Reservation
- Nez Perce Tribe
- The general public

Figure 2-1. Overview of Screening Level Risk Assessment Process for RPP-WTP Air Emissions



Hanford ERA - 001

Figure 2-2. Overview of Screening Level Risk Assessment Process During the Preliminary Risk Assessment and the Final Risk Assessment for RPP-WTP Air Emissions



Hanford ERA - 002

Chapter 3

3. Engineering Description

The River Protection Project Waste Treatment Plant (RPP-WTP) is being developed to treat mixed waste stored at the US Department of Energy, Richland Operations Office (DOE-RL) Hanford Site. Waste treatment will be performed using a pretreatment system and two independent vitrification systems. Offgas generated by the pretreatment and vitrification processes will be treated in independent offgas treatment systems. This section provides an overview of the mixed waste treatment processes that will be used in the RPP-WTP. More detailed process information can be found in Chapter 4, Section 4.2, of the RPP-WTP Dangerous Waste Permit Application (BNFL Inc. 2000a).

The mixed waste to be treated in the RPP-WTP is consistent with the definition of high level waste found in 10 CFR 72.3. The mixed waste is further classified into a low activity waste (LAW) feed and a high level waste (HLW) feed. The LAW feed consists primarily of the aqueous phase supernatant containing soluble solids presently stored in the Hanford tank system. The HLW feed is primarily an aqueous slurry with a higher solids content than the LAW feed. The composition of the liquid fraction of the HLW feed is similar to LAW feed, whereas the HLW feed solids consist of precipitated metals, and radioisotopes of uranium, plutonium, and strontium.

Two vitrification systems are being designed to immobilize the radioactive waste: one for LAW feed and the second for HLW feed. Waste will be immobilized in the form of glass monoliths contained in metal containers. These IHLW and ILAW containers, and other containers of various secondary wastes generated during treatment operations, will be temporarily stored at the RPP-WTP and then transferred to other permitted treatment, storage, or disposal (TSD) facilities.

3.1. RPP-WTP Overview

BNFL Inc. has entered into a contract with DOE-ORP for pretreatment and vitrification of radioactive waste stored in underground tanks at the Hanford Site. Underground storage tanks located at the Hanford Site consist of single shell and double shell tanks operated by the DOE Office of River Protection. Waste contained in the single shell tanks will be transferred to double shell tanks prior to being transferred to the RPP-WTP. The LAW feed and HLW feed will be retrieved and transferred, by DOE or its agent, from the double shell tanks to facilities designed, built, and operated by BNFL Inc. for pretreatment and vitrification. Vitrified immobilized waste and secondary waste generated by the processes will be transferred to permitted storage, and/or disposal units for disposition.

DOE is leasing property at the Hanford Site to BNFL Inc. for construction and operation of the RPP-WTP. The leased land lies at the eastern end of the 200 East Area of the Hanford Site, near the former Grout Treatment Facility, 241-AP Tank Farm Complex, and Plutonium Uranium Extraction Plant (PUREX). The location of the RPP-WTP on the Hanford Site is shown in Figure 3-1.

As shown in Figure 3-2, the RPP-WTP will include several primary buildings. Four main process buildings will contain most of the dangerous waste management operations, and include major areas for pretreating HLW and LAW feed, and immobilizing tank waste in the LAW vitrification plant and HLW vitrification plant. Other smaller support buildings such as the wet chemical storage building, the glass-former storage building, the central waste storage area, and two melter storage buildings will provide for storage or transfer of materials used in the treatment process, and for storage of wastes.

The waste treatment plant will store and treat HLW feed and LAW feed from the Hanford Site DST system unit. The treatment processes are designed to pretreat both LAW feed and HLW feed, immobilize waste in a glass matrix through vitrification, and treat the offgas. Two separate melter or vitrification

processes will be used: one melter process will produce ILAW, and the other will produce IHLW. Figure 3-3 provides simplified process flow diagrams of the treatment processes.

3.2. Pretreatment

The RPP-WTP will contain processes for pretreating and immobilizing both LAW feed and HLW feed, as indicated in the simplified process flow diagram shown in Figure 3-3. Characterized LAW and HLW feeds will be transferred from the Hanford tank system to the pretreatment plant. All waste transfers will be made through double-contained transfer pipes with leak-detection systems.

The following four waste types, or envelopes will be treated in the RPP-WTP.

- Envelope A. This LAW feed envelope will contain cesium and technetium at concentrations high enough to warrant removal during pretreatment in order to ensure the immobilized LAW glass meets applicable requirements.

- Envelope B. This LAW feed envelope will contain higher concentrations of cesium than Envelope A. Both cesium and technetium must be removed to comply with the contract specifications for ILAW. This envelope will also contain concentrations of chlorine, chromium, fluorine, phosphates, and possibly sulfates, than those found in Envelope A, and which may limit the rate of waste incorporation into the glass.

- Envelope C. This LAW feed envelope will contain organically complexed strontium and transuranic (Sr/TRU) compounds that will require removal in a processing step unique to this waste envelope. As with Envelopes A and B, cesium contract ILAW specifications can be met.

- Envelope D. HLW feed envelope will be in the form of a slurry containing 10-200 grams of solids per liter of slurry. The liquid fraction of the slurry will be comprised of Envelope A, B, or C waste, and the solid fraction will be Envelope D waste. Envelope D waste will be delivered via pipeline into a receipt vessel or vessels located in the pretreatment process building.

LAW feed and HLW feed will first be treated in the pretreatment system. As shown in Figure 3-3, the pretreatment system will be divided into LAW and HLW components.

3.2.1. LAW Pretreatment

Pretreatment of the LAW feed will occur in two plants: the pretreatment plant and the LAW pretreatment plant. Process steps include reducing radionuclide concentrations and reducing the volume of waste being fed to the LAW vitrification system. In addition, in order to ensure that the limits for the concentrations of the following constituents in the ILAW glass will be met, the LAW pretreatment process will remove entrained solids, Sr and TRU compounds (Envelope C only), Cs and Tc. The removed constituents, with the exception of entrained solids, will be incorporated into the HLW melter feed. Entrained solids will either be returned to another permitted unit located at the Hanford Site or will be incorporated in the HLW or LAW melter feed.

3.2.1.1. LAW Feed Receipt

LAW feed will be pumped from the Hanford tank system via a double-walled pipeline into the LAW feed receipt vessels. These six receipt vessels are identical in design and are located in one cell. Two identical pipelines, one in operation and the other on standby, will be used for the transfer. Each pipeline will be

equipped with a leak detection system. Both rejected LAW feed and entrained solids from LAW ultrafiltration may be returned to the Hanford tank system via the same pipelines.

Each feed receipt pipeline can be routed to any of the six feed receipt vessels. Prior to a transfer, four of the vessels will be designated as the "active" receptors of the LAW feed. The remaining two vessels will be available to provide contingency space to avoid emergency transfers back to the Hanford tank system, in the event of a leak, overflow, or spill from the other vessels. During the transfer, no operations such as mixing may occur in the active vessels, nor may any other transfers be made to or from the active vessels. After delivery completion, the transferred feed volume will be confirmed, and the feed will be sampled and analyzed. Depending on the results of the analysis, the feed will be either transferred to LAW feed evaporation or transferred back to the Hanford tank system. Rejection of a completed feed transfer should never occur, but the option is left open, if confirmation sampling and analyses show that the waste is significantly different than indicated by previous data.

3.2.1.2. LAW Feed Evaporator

The LAW feed stream will be evaporated as needed in the feed evaporator to provide a consistent feed composition for ultrafiltration, in order to minimize the amount of reagents used for strontium and TRU removal (in envelope C) and to optimize ion-exchange performance. The LAW feed evaporator will be a continuous forced circulation vacuum evaporator that will concentrate the feed. The LAW feed will be recirculated through the evaporator reboiler until the sodium content of the stream reaches the desired concentration. The concentrated LAW feed will then be pumped to buffer tanks. The vapor stream from the evaporator will be condensed and routed to the process condensate tanks. If the condensate exceeds radioactivity limits, it will be routed to a contaminated condensate vessel and then back to the LAW feed evaporator. If it does not exceed radioactivity limits, it will be routed to a process condensate vessel, from which it may be routed to the Hanford Liquid Effluent Retention Facility/Effluent Treatment Facility (LERF/ETF), recycled as process water or routed to the contaminated condensate vessel.

3.2.1.3. Ultrafiltration

Following evaporation, the concentrated LAW feed will be sent to the ultrafiltration process to separate entrained solids and, in the case of envelope C, to remove strontium and TRU.

The entrained solids for all envelopes will be concentrated, washed to remove soluble components, and then sampled and analyzed to determine their final destination. For envelopes A and B, the permeate from separation of the entrained solids will be transferred to the cesium ion-exchange process.

After the entrained solids have been removed from envelope C wastes, strontium and TRU elements will be removed by precipitation. The resulting precipitate will be concentrated and washed in the ultrafiltration process before being routed to HLW feed receipt and storage. The separated Sr and TRU precipitate will be mixed with HLW feed and with pretreated cesium and technetium eluates (see section 3.2.1.5 for technetium eluate) from the ion-exchange process. The waste feed will then be incorporated into the HLW melter feed.

Ultimately, the concentrated entrained solids from envelopes A, B and C will either be transferred to a Hanford Site TSD unit or incorporated into the HLW or LAW melter feed.

3.2.1.4. Ion Exchange

To meet ILAW specifications, the radioactive cesium content of the LAW feed must be reduced. Permeate from ultrafiltration will enter the ion exchange system where the cesium concentration will be reduced by passing the feed through successive ion exchange systems.

The system will have two sets of ion exchange columns arranged in parallel and one final ion exchange column. Each set will consist of two columns arranged in series, one in the lead position and the second in the lag position. One set from each system will process feed, while elution and regeneration take place on the lead column of the other set. When cesium loading on the lead column has reached approximately 50 % cesium breakthrough, or when any significant breakthrough is seen after the lag column, the flow to that set of columns will be suspended and the LAW feed diverted to the other set of columns. The final, or trailing, column will function as a third column in series for either pair of main columns during loading.

At this stage, cesium will be removed from the lead column using a nitric acid solution and the resins will be regenerated for reuse. The resin will have a finite useful life, after which it will be removed from the columns and replaced. Spent resin will ultimately be transferred to a Hanford Site TSD facility for disposal. Ion exchange media or resins are discussed further in Chapter 4 of the RPP-WTP DWPA.

Using evaporation, nitric acid will be recovered from the cesium eluate taken from the ion-exchange column. This recovery will allow reuse of recovered nitric acid and will also reduce the storage volume of the intermediate waste. An evaporation system will be used to concentrate the cesium eluate. The resultant concentrates will be stored prior to blending with the pretreated HLW feed, the separated strontium and TRU, and the technetium concentrate (as discussed below).

3.2.1.5. LAW Pretreatment Plant

Following the removal of cesium, the LAW feed will be transferred to the LAW pretreatment plant for removal of technetium in an ion exchange system. The technetium removal system will consist of four ion exchange columns, arranged as two sets of two columns in parallel. One set will operate in the loading cycle while the other set is being regenerated. One set will process feed, while elution and regeneration take place on the lead column of the other set.

When technetium loading on the lead column has reached approximately 50 % breakthrough or a significant proportion of the constituent has been detected in the effluent from its respective lag column, the two columns will be taken offline and the resin in the lead column will be regenerated. At this stage technetium will be eluted with water and the resins will be regenerated for reuse. The resultant technetium concentrates will routed back to the pretreatment plant for where it will be stored prior to blending with cesium concentrates, the pretreated HLW feed, and the separated strontium and TRU.

Resins used in the ion exchange columns cannot be regenerated indefinitely. Therefore, the resin must periodically be removed from the ion exchange columns and replaced. The spent resin collection and dewatering system fluidizes the ion exchange columns using a flush liquor that hydraulically discharges the contents into spent resin collection vessels. Here, the resin slurry will be circulated, monitored for technetium content, and delivered to a sampling system to determine if the resin meets Hanford Site acceptance criteria.

Spent resin that does not meet the criteria will be routed back to the ion exchange columns for re-elution. Spent resin that meets the criteria will be transferred to dewatering containers where water will be

removed and will ultimately be transferred to a Hanford Site TSD facility for disposal. Liquor from the dewatering process will be reused as flush liquor for the ion exchange columns.

Following the ion exchange step, the LAW vitrification feed preparation system will concentrate the waste by evaporation, as needed, to reduce the volume that must be processed through the LAW melters. Concentration of the product will be controlled to avoid precipitation of soluble compounds.

The concentrated waste feed will be discharged to the concentrated LAW melter feed holding tank. The solution will then be transferred to a receipt tank or tanks in the LAW vitrification building. The condensate from the LAW melter feed evaporator will be combined with condensate from the LAW feed evaporator, characterized, and either recycled within the process or transferred to the Hanford Liquid Effluent Retention Facility/Effluent Treatment Facility (LERF/ETF).

3.2.2. HLW Pretreatment

HLW feed will be transferred from the Hanford tank system to the HLW feed receipt tanks. Following receipt, the HLW feed will be sent to the ultrafiltration vessels to separate HLW solids. In the ultrafiltration vessels, solids will be concentrated, and washed (using either process water or caustic solution) to remove soluble components (mainly Na salts). The ultrafiltration permeate will be transferred to the LAW pretreatment system and treated in the same manner as the LAW feed. The solids concentrate from the ultrafilter will be stored in the HLW feed lag storage vessels. The washed sludge will be combined with Cs, Tc, and Sr and TRU removed in the LAW pretreatment system, and will be transferred to the HLW vitrification system.

3.2.3. Pretreatment Emissions Control

Gaseous emissions will be produced within the pretreatment plant and the LAW pretreatment plant, from fluid transfer devices and agitators, exhausters, evaporator overheads, ejector transfers, and filling or emptying of vessels. Pretreatment emissions will be passed into the vessel ventilation system and treated in an emissions treatment system, which will consist of:

- High efficiency mist eliminators (HEMEs), to remove entrained droplets and particulates.
- Counter-current scrubber, to remove acid gases. Excess scrubber solution will be transferred to the LAW pretreatment system.
- High efficiency particulate air (HEPA) filtration with preheater.

The LAW pretreatment plant vessel ventilation system will include a VOC oxidation unit, HEPA filters, and carbon bed adsorbers. Primary functions of this system include:

- Collect offgas from LAW pretreatment vessel vents
- Remove particulates from vent system offgas
- Prevent condensation in the HEPA filters
- Adsorb and/or oxidize organic gases
- Collect exhaust streams from LAW pretreatment system RFD and PJM jet pumps

The combined LAW pretreatment plant treated vessel ventilation offgas and treated RFD and PJM exhaust streams will be routed to the Pretreatment plant. Pretreatment and LAW pretreatment cleaned

emissions streams will be monitored for radionuclides and other constituents, and released through the pretreatment building stack.

3.3. LAW Vitrification

The pretreated LAW feed will be processed in three melters. Offgas produced as a result of waste treatment will be treated in an offgas treatment system. The following sections address the LAW vitrification system, offgas treatment systems, waste feed cutoff system, and control devices. Figure 3-3 depicts the vitrification and offgas treatment systems.

3.3.1. LAW Vitrification System

The primary functions of the LAW vitrification system are to:

- Convert blended waste slurry and glass-forming chemical additives into molten glass
- Discharge molten glass to metal containers

A blend of glass-forming chemical additives will be used in the LAW glass recipe. For example, silica, alumina, boric acid, calcium silicate (wollastonite), ferric oxide, lithium carbonate, magnesium silicate (olivine), zircon sand, and zinc oxide will be used. Each glass recipe will be prepared from formulations, developed by Vitreous State Laboratory (VSL), that were found to produce durable glass (Matlock and Pegg 1999). These chemical additives will be stored in silos prior to use. Reductant (sucrose) will be added with the glass-forming chemicals to enhance melter performance.

From the storage silos, dry chemicals will be weighed and transferred into a pneumatic blending silo, which will use compressed air to blend a batch of dry chemicals. Each dry chemical will be weighed, then transferred to the blend hopper. After blending, the glass-formers will be transferred to a feed hopper within the main facility and held until they are required for use. Weighing will be used to confirm dry chemical transfers. Each melter will have a glass-former feed hopper sized for preparation of a melter feed batch. The entire contents of the feed hopper are used in the preparation of a melter feed batch.

Following process related sampling and analysis, the concentrated waste will be combined with glass forming chemicals and then mixed. This material will be transferred as slurry to the LAW melter feed tanks in order to provide continuous feed to each of the three LAW melters. Three electric powered, joule heated LAW melters will operate in parallel. Each melter will have a nominal throughput capacity of 10 metric tons and a maximum of 16.6 tons of glass per day. The operating temperature of the melter will be between 950 °C and 1,250 °C. As the LAW feed enters the melter, it will form a cold cap of dried solids on the surface of the molten glass. An air agitation system will be used to incorporate the cold cap into the melt and mix the melt to enhance melter performance. The outer shell of the melter containing the molten glass bath will be water cooled in order to minimize migration of molten glass within the melter refractory and to reduce the heat load to the melter cave.

Feed components will be converted to their respective oxides, and form the glass melt. As these materials are heated, gases will be released into the melter offgas system. Molten glass will be discharged into stainless steel containers. The containers will be cooled, welded closed, decontaminated, stored, and finally transferred to a permitted disposal unit. The process will yield a durable glass containing immobilized LAW.

3.3.2. LAW Offgas Treatment System

The principal components of the offgas will be nitrogen and oxygen, which will result from the controlled introduction of air into the melter, the operation of the air agitation system, and the chemical decomposition reactions occurring in the melter. Water in the feed will be evaporated or flashed to steam in the melter and condensed in the offgas system. Also contained within the offgas will be radionuclides, primarily as aerosols, nitrogen oxides (NO_x) generated from the decomposition of nitrates in the waste feed, organic compounds, chloride, fluoride, and sulfur oxides.

The LAW offgas treatment system will treat normal offgas flows and intermittent surges of up to seven times the normal flow rate for condensable gases, such as steam, and up to three times the flow rate for noncondensable gases.

The LAW offgas treatment system will be composed of four components: a primary melter offgas treatment system, a secondary offgas treatment system, a vessel ventilation treatment system, and a standby offgas system.

3.3.2.1. Primary LAW Melter Offgas Treatment System

The purpose of the primary melter offgas system is to cool the offgas and remove the aerosols generated by each melter. It will consist of the following components:

- Film cooler
- Submerged bed scrubber (SBS)
- Wet electrostatic precipitator (WESP)

The following paragraphs describe these components in greater detail.

Film cooler.

Offgas will exit the melt chamber and be mixed with compressed air in the LAW melter offgas film cooler. The film cooler will be an integral part of the melter, and will consist of a double-walled pipe designed to introduce steam and/or air (or a mixture of steam and air) along the walls of the offgas pipe through a series of holes or slots in the inner wall. This process will provide a film of air (or mixture of steam and air) flow along the pipe wall to cool the offgas. It will also ensure the offgas maintains a high velocity, to minimize the deposition of aerosols. A water spray ring and a mechanical reamer inserted into the offgas discharge line from the melter will be provided to remove buildup, if necessary. Dislodged particulates will either fall back into the melt pool, or be carried into the offgas stream and removed by the SBS.

Submerged bed scrubber.

The submerged bed scrubber (SBS) will remove entrained gross particulate, soluble material and organic components from the offgas, and will also cool the offgas prior to subsequent treatment. Offgas will be scrubbed by drawing it into a packed bed covered with liquid. It will enter the SBS through an inlet pipe that will run down through the center of the packed bed. Gas bubbles formed underneath the packing support plate will be broken up and scrubbed as the gas rises through the packing. Steam generated in the melter will condense in the submerged bed scrubber, and the resulting water overflow will be directed to the LAW offgas condensate collection vessel. The offgas condensate will be recycled to the pretreatment system.

Wet electrostatic precipitator.

After larger aerosols have been removed in the submerged bed scrubber, the cooled offgas will be routed to a wet electrostatic precipitator (WESP). Ionizing electrodes located inside tubes within the WESP will create strong electrical fields that will charge aerosols entrained in the offgas stream. The charged aerosols will be removed from the offgas as they adhere to the oppositely-charged tube walls. The aerosols will be washed from the tube walls and collected in the sump, which will drain into the WESP drain.

3.3.2.2. Secondary LAW Offgas Treatment System

The secondary LAW offgas treatment system will consist of the following components:

- HEPA filtration
- Thermal catalytic oxidation unit
- Selective catalytic reduction (SCR) unit
- Caustic Scrubber

The following paragraphs describe these components in greater detail.

High-efficiency particulate air filtration.

After leaving the WESP, the offgas will pass through the HEPA preheater to raise its temperature above the dewpoint in order to prevent condensation as it passes through HEPA filtration. HEPA filters are capable of removing particulates 0.3 micrometer in diameter and larger, with an efficiency of 99.97%.

Thermal catalytic oxidation unit.

The offgas will pass through a heater to raise its temperature to the desired operating range for removal of volatile organics in a catalytic oxidation unit. This unit will use a precious metal catalyst to facilitate the decomposition of organics to carbon dioxide (CO_2) and water vapor. The treated offgas will be discharged to the SCR unit.

Selective catalytic reduction unit.

Gaseous NO_x will be removed in a SCR unit and converted to nitrogen and water, using ammonia as the reducing agent. The reaction will occur in catalyst beds within the SCR column. Depending on inlet gas concentration, it will be possible to achieve high NO_x removal efficiencies. The catalyst will be replaced periodically to ensure that offgas treatment adheres to design specifications. Careful control of the ammonia addition will be necessary to minimize residual ammonia in the offgas stream.

Caustic scrubber

Offgas exiting the SCR unit will enter a caustic scrubber. Contaminants in the offgas stream will be absorbed into a caustic liquid stream flowing counter-current to the offgas. The caustic scrubbing liquid will remove acid gases and carbon-14 (as carbon dioxide) from the offgas. These contaminants will be absorbed into the liquid stream through interaction of the gas, liquid, and scrubber column packing media. To neutralize the collected acid gases, sodium hydroxide solution will be added to the top of the scrubbing column and will serve as the scrubbing liquid. The scrubbing liquid will be recirculated

through the column. After scrubbing, the treated offgas will be monitored and released through the LAW building stack.

3.3.2.3. LAW Vessel Ventilation System

Within the LAW vitrification plant, gaseous emissions will be produced from vessel vents and various equipment related to the LAW melter system. All vessel ventilation lines will be connected to the main vessel ventilation header. This main header will join the primary offgas treatment system lines downstream from the WESP and immediately upstream from the preheater for the secondary offgas system HEPA filters. The combined melter offgas streams and the vessel ventilation offgas stream will then go into the LAW secondary offgas treatment system described above.

3.3.2.4. Alternate Route

Infrequently, each melter may experience a reduction in vacuum, which will actuate an alternate route into the offgas treatment system. The following are abnormal situations that would require diversion:

- Plugging of the air film cooler line from the melter to the submerged bed scrubber
- Melter surge in excess of the design basis of seven times the volume of condensable gases and three times noncondensable gases

Automated gas pressure monitoring, alarm and control devices will detect the above conditions. Each LAW melter will have an alternate route into the offgas treatment system. The alternate route will consist of a fast-actuating butterfly valve and a redundant bypass film cooler line from the melter to the submerged bed scrubber.

In the event of a plug developing in the line from the melter to the submerged bed scrubber, or a surge in offgas resulting in reduction of vacuum below the minimum normal set point, the butterfly valve will open the alternate route to the submerged bed scrubber. On the alternate route, air and steam will flow through the bypass film cooler to cool the offgas and minimize the deposition of solids on the pipe wall.

A general power failure is estimated to occur on average once in 10 years. In such a situation, the standby generators may take from 15 to 30 seconds to come online. During this transition to standby power, the offgas exhaust fans will be without power, and offgas would leak from the melter to the cave. Ventilation air for the melter cell will be subject to all C5 ventilation maximum contamination controls, and will be HEPA filtered to prevent or control the release of emissions during or following such an occurrence. (See 3.5 Cascade Ventilation System.)

3.3.3. Automatic Waste Feed Cutoff System

The automatic waste feed cutoff system will prevent the introduction of LAW feed into the melter when key process conditions fall outside of the predetermined range. As a minimum, the automatic waste feed cutoff system will automatically lock out operation of the waste feed system until proper operating conditions are restored.

3.4. HLW Vitrification

The pretreated HLW feed will be vitrified in one melter. The HLW vitrification plant is being designed with a second HLW melter cave for the installation of a second melter if increased waste processing is

warranted. Offgas produced as a result of HLW vitrification will be cleaned in an offgas treatment system. The following sections address the HLW vitrification system, offgas treatment system, waste feed cutoff system, and control devices. Figure 3-3 depicts the HLW vitrification and offgas treatment systems.

3.4.1. HLW Vitrification System

The primary functions of the HLW vitrification system are to:

- Convert blended waste slurry and glass-forming chemical additives into molten glass
- Discharge molten glass to metal containers

A blend of glass-forming chemical additives will be used in the HLW glass recipe. For example, silica, boric acid, calcium silicate (wollastonite), ferric oxide, and lithium carbonate will be used. Not all of these additives will be used in each glass recipe. Each glass recipe will be prepared from formulations, developed by Vitreous State Laboratory (VSL), that were found to produce durable glass (Matlock and Pegg 1999).

The glass-forming chemicals will be stocked in storage silos. Each dry chemical will be conveyed from its storage silo, weighed, and then transferred into a pneumatic blending silo where compressed air will be used to blend dry chemicals for the HLW melter. After blending, the glass-forming chemicals will be transferred to the feed hopper located within the main facility until they are required for use. A reductant (sucrose) will be added with the glass-forming chemicals to enhance melter performance. Weighing will be used to confirm dry chemical transfers, once the chemicals have been placed in the feed hopper. The entire contents of the feed hopper will be used in the preparation of a melter feed batch.

Waste feed will be transferred to the HLW melter feed vessel, from which it will be fed directly to the HLW melter. The HLW melter will have a nominal throughput capacity of 1.5 metric tons per day and a maximum capacity of 3 metric tons per day. The operating temperature of the melter will be between 950 °C and 1,250 °C. As the HLW feed enters the melter, it will form a cold cap of dried solids on the surface of the molten glass. An air bubbler agitation system will be used to incorporate the cold cap into the melt and mix the melt to enhance melter performance. The steel outer shell of the melter will be water cooled to minimize migration of molten glass within the melter refractory and to reduce the heat load to the melter cave.

The feed components will undergo chemical reaction, be converted to their respective oxides, and form the glass melt. As these materials are heated, gases will be released into the melter offgas system. Molten glass will be discharged to stainless steel containers for cooling, solidification, and storage. The process will yield a durable glass containing immobilized HLW.

3.4.2. HLW Offgas Treatment System

The HLW melter offgas will consist of steam, products of chemical decomposition reactions that occur in the melter, organic compounds, and radionuclides. Its volume will be smaller than that of the LAW melter offgas and will contain little NO_x; however, it will have a considerably higher radioactivity level.

The HLW offgas treatment system will treat normal offgas flows and intermittent surges of up to seven times the normal flow rate for condensable gases, such as steam, and up to three times the normal flow rate for noncondensable gases. The system will be composed of four components: a primary melter

offgas treatment system, a secondary offgas treatment system, a vessel ventilation treatment system, and a standby offgas system.

3.4.2.1. Primary HLW Melter Offgas Treatment System

The primary HLW melter offgas treatment system will consist of the following components:

- Film cooler
- SBS
- WESP
- HEME
- HEPA filtration

The following paragraphs describe these components in greater detail.

Film cooler.

Offgas will exit the melt chamber and be mixed with compressed air in the HLW melter offgas film cooler. The film cooler will be an integral part of the melter, and will consist of a double-walled pipe designed to introduce steam and/or air (or a mixture of steam and air) along the walls of the offgas pipe through a series of holes or slots in the inner wall. This process will provide a film of air (or mixture of steam and air)flow along the pipe wall to cool the offgas. It will also ensure the offgas maintains a high velocity, to minimize the deposition of aerosols. A water spray ring and a mechanical reamer inserted into the offgas discharge line from the melter will be provided to remove buildup, if necessary. Dislodged particulates will either fall back into the melt pool, or be carried into the offgas stream and removed by the SBS.

Submerged bed scrubber.

The SBS will remove entrained gross particulate, soluble material and organic components from the offgas, and will also cool the offgas prior to subsequent treatment. Offgas will be scrubbed by drawing it into a packed bed covered with liquid. It will enter the SBS through an inlet pipe that will run down through the center of the packed bed. Gas bubbles formed underneath the packing support plate will be broken up and scrubbed as the gas rises through the packing. Steam generated in the melter will condense in the submerged bed scrubber, and the resulting water overflow will be directed to the HLW offgas condensate collection vessel. The offgas condensate will be recycled to the pretreatment system.

Wet electrostatic precipitator.

After the larger aerosols have been removed in the SBS, the cooled offgas will be routed to a WESP. Ionizing electrodes located inside tubes within the WESP will create strong electrical fields that will charge aerosols entrained in the offgas stream. The charged aerosols will be removed from the offgas as they adhere to the oppositely charged tube walls. The aerosols will be washed from the tube walls and collected in the sump, which will drain into the WESP drain collection tank.

High efficiency mist eliminator.

The HEME, a high efficiency demister with a removal efficiency of about 99% for aerosols down to submicron size, will further remove aerosols from the melter offgas stream. Aerosols adhere to fiber-packing filaments within the HEME by surface tension. As the droplets grow they acquire enough mass

to fall by gravity to the bottom of the unit, where they will be collected and drain into the HEME collection tank.

High efficiency particulate air filtration.

From the HEME, the offgas will pass through the HEPA preheater, where it will be heated to above the dewpoint in order to prevent condensation within the HEPA filters. The HEPA filters are capable of removing particulates of 0.3 micron and greater, with an efficiency of 99.97%. The cleaned offgas will be discharged to the secondary HLW offgas treatment system.

3.4.2.2. Secondary HLW Offgas Treatment System

The secondary HLW offgas treatment system will consist of the following components:

- Caustic scrubber
- Thermal catalytic oxidation unit

The following paragraphs describe these components in greater detail.

- Caustic scrubber. The offgas flow from the HEPA filters will be treated by the HLW offgas caustic scrubber. The scrubber will use a solution of sodium hydroxide (NaOH) to remove soluble organics, acid gases, NO_x, and CO_2 (including radioactive $^{14}CO_2$) from the offgas. The scrubber liquor will be combined with condensate or purge from the HLW melter submerged bed scrubber, and then will be either returned to the LAW feed evaporator, or sampled and transferred to the permitted Hanford Liquid Effluent Retention Facility/Effluent Treatment Facility (LERF/ETF).

- Thermal catalytic oxidation unit. After exiting the wet scrubber, the HLW offgas will pass through an electric preheater to raise its temperature to the desired operating range for removal of residual volatile organics in a catalytic oxidation unit. This unit will use a precious metal to facilitate the decomposition of organics to carbon dioxide (CO_2) and water vapor. The treated offgas will be monitored and discharged through the HLW plant stack.

3.4.2.3. HLW Vessel Ventilation Treatment System

Within the HLW vitrification plant, gaseous emissions will be produced from vessel vents and various equipment related to the HLW melter system. All vessel ventilation lines will be connected to the main vessel ventilation header. The main header will join the HLW offgas treatment system lines downstream from the WESP and upstream from the HEME. The combined melter offgas stream and the vessel ventilation offgas stream will be treated in the remaining portion of the HLW primary offgas treatment system and the HLW secondary offgas treatment system.

3.4.2.4. Alternate Route

In the event of a plug developing in the film cooler line from the melter to the submerged bed scrubber, or a surge in offgas that reduces the melter vacuum below the minimum normal set point, a butterfly valve will open the alternate route to the submerged bed scrubber. On the alternate route, air and steam will flow through the bypass film cooler line to cool the offgas and minimize the deposition of solids on the pipe wall.

A general power failure is estimated to occur on average once in 10 years. In such a situation, the standby generators may take from 15 to 30 seconds to come online. During this transition to standby power, the offgas exhaust fans will be without power, and offgas would leak from the melter to the cell. Ventilation air for the melter cell will be subject to all C5 ventilation maximum contamination controls, and will be HEPA filtered after power is restored to prevent or control the release of emissions during such an occurrence. Much of the offgas leaked from a melter during such a short power outage would actually be recaptured into the melter offgas treatment system after power is restored, because a large portion of the offgas is normally drawn from the ambient air in the immediate vicinity of the melter. (See 3.5 Cascade Ventilation System.)

3.4.3. Automatic Waste Feed Cutoff System

The automatic waste feed cutoff system will prevent the introduction of HLW feed when key process conditions fall outside of a predetermined range. As a minimum, the automatic waste feed cutoff system will automatically lock out operation of the waste feed system until proper operating conditions have been restored.

Parameters that will initiate the automatic waste feed cutoff system are being designed. When these parameters have been finalized, a list of automatic waste feed cutoff initiating parameters will be provided in this section. See Appendix A for the proposed information completion schedule.

3.5. Cascade Ventilation System

A primary factor in the design of the ventilation system for the RPP-WTP is the need to isolate the sources of radiation, and radiological and dangerous waste contamination, to protect human health and the environment during normal and abnormal operating conditions. Barriers or barrier systems, including ventilation systems, will contain and minimize the release of radionuclides and contaminants. The ventilation systems are designed to conform to stringent nuclear facility ventilation standards, and fugitive emissions from the pretreatment and vitrification facilities will be minimized.

The pretreatment plant, LAW pretreatment plant, LAW vitrification plant and HLW vitrification plant will be divided into four numbered zones, with the higher number indicating greater contamination potential and therefore a requirement for a greater degree of control or restriction. A separate zoning system for the ventilation systems will be based on the system for classifying building areas for potential contamination. Zones classified as C5 will have the potential for the greatest contamination and will include the pretreatment cells, melter cells, and glass pouring and cooling cells. All C5 zones will be operated remotely. Zones classified as C1 will be those areas that have no risk of contamination, such as equipment rooms and offices.

Confinement will be achieved by maintaining C5 areas at the greatest negative pressure, with airflows cascaded through engineered routes from C2 areas via C3 areas to the C5 areas. The principle of a cascade system, in which air passes through more than one area, effectively reduces the number of separate ventilation streams and hence the amount of air requiring treatment. Adherence to these principles in the design and operation of the RPP-WTP will ensure that the plant will not become a significant source of radiological or dangerous waste exposure to operators, or emissions to the environment.

3.6. Fugitive Emissions

The following sections address fugitive emissions. Because of the stringent design of the processing facilities, it is not anticipated that fugitive emissions will be emitted from the pretreatment, LAW

vitrification, or HLW vitrification processes. Insignificant amounts of fugitive emissions are anticipated from the materials storage areas that will support the processing plants.

3.6.1. Waste Treatment Processing Facilities

The RPP-WTP ventilation system will be designed to confine all sources of contamination and, thus, fugitive releases of COPCs to the environment are not anticipated. Confinement will be achieved through a combination of barriers or barrier systems, coupled with a cascade ventilation system that will be designed to conform to stringent nuclear facility ventilation standards.

The key to prevention of fugitive emissions will be that the more contaminated areas will be maintained at a negative pressure with respect to the less contaminated areas. That is, C5 areas will be maintained at the greatest negative pressure, with air flows cascaded through engineered routes from C2 areas via C3 areas to C5 areas. The pressure gradient will ensure that no fugitive emissions are released from the processing plants (pretreatment, LAW vitrification, and HLW vitrification). The air flow that reaches the C5 area will then be HEPA filtered and routed to the building stack.

3.6.2. Material Storage Systems

Two storage facilities not directly associated with the main processing plant will have the potential to be minor sources of fugitive emissions: the glass-former storage system, and the nitric acid storage system.

The glass-former storage bins will provide bulk storage for the alumina, boric acid, iron oxide, and similar materials that will be used as part of a recipe to support glass formation in the melters. These materials will have no radiological contamination and will not contain COPCs, but very small levels of particulate emissions may occur during periodic refilling of the bins by outside vendors. The storage systems will have filters installed to minimize emissions during filling and normal operations.

The wet chemical storage system will be maintained to provide the nitric acid and other bulk chemicals used in operating the process plant. Emissions from this facility are not expected to be significant.

3.7. Upset Conditions

Process upset conditions include periods of startup, shutdown, or process malfunction; that is, the unit is operating outside the permitted operating conditions. Process upset conditions are generally assumed to result in greater than normal stack emissions during the short period of the upset. The potential for increased emissions during upset conditions will be addressed in this section through an analysis of the processing system of each of the three main components of the facility: pretreatment system, LAW vitrification, and HLW vitrification.

3.7.1. Upset Conditions in the Pretreatment Systems

The pretreatment plant and LAW pretreatment plant ventilation systems will be designed to accommodate several inputs from various unit operations and components. Inputs from these unit operations will be composed, in part, of streams originating from evaporator operations and acid/base reactions. It is expected that normal operations will produce volatilization of semivolatile components and that these components will enter the vessel ventilation system, as designed. The ventilation system will capture these components at prescribed decontamination factors through a series of condensers, scrubbers, HEMEs, filters and other ventilation components prior to entering the discharge stream.

Since normal design operating temperatures and pressures are at the boiling point of the process stream, volatilization of semivolatile components will occur under normal operation. Consequently, an upset condition that impacts temperature or pressure will not produce emissions of semivolatile components in excess of those found during normal operations.

The failure of a ventilation component, such as a condenser, may result in the localized elevation of a semivolatile component concentration. However, the safeguards and control system interlocks for the ventilation system will be in place to notify the operators and initiate a safe shut down of the affected systems. The safe shut down of the ventilation system will reduce the volumetric throughput of the ventilation system and reduce the likelihood that decontamination factors would be exceeded.

In summary, the design of the ventilation system associated with the pretreatment process and LAW pretreatment process will adequately handle the emissions from upset conditions. There are no other anticipated upset conditions associated with the pretreatment systems that would result in additional emissions to the environment.

3.7.2. Upset Conditions in the LAW and HLW Melters

The most likely process upset in the LAW and HLW melters is a loss of vacuum in the melters. The melter offgas system is designed to treat normal offgas flow rates and intermittent surges of 7 times the normal flow rate for condensable gas flow and 3 times the noncondensable gas flow. Should a loss or significant reduction of vacuum occur due to a gas surge or clogging of the film cooler pipe, the upset will be controlled by automatic opening of the fast acting butterfly valve, allowing flow through the bypass film cooler line to the submerged bed scrubber.

If the "bypass" to the SBS is activated, waste feed to the melter will be stopped, the cold cap on the melter allowed to be consumed, and the melter brought to idle condition until the cause for the activation is investigated and necessary repairs made. In a bypass condition, the offgas will be treated by the backup film cooler, SBS and all the downstream offgas treatment units, therefore, no pollution control equipment is bypassed.

In the event of a complete power failure, a loss of vacuum could occur for a brief time, one minute or less, until backup power is available. The melter offgas would leak into the melter cave during that time, because the offgas exhaust fans would be without power. Within the building C5 ventilation system, the offgas will be passed through HEPA filters after power is restored, monitored for compliance with emission standards, and released through the building stack.

3.8. Facility Control Philosophy

This section presents an overall control philosophy for the RPP-WTP. The facility control philosophy goal is to satisfy the following criteria:

- Preservation of worker and public safety
- Protection of the environment
- Preservation of equipment integrity
- Assurance of product quality
- Minimization of plant lifetime costs

The measures proposed to achieve these goals are as follows:

The possibility of human error in facility operation will be addressed in the design hazards analysis. A simple and consistent operator interface will be developed for use throughout the facility.

- Automation will be used to optimize throughput and reduce operator radiological exposure. Where necessary, the system will be designed to allow human decisions required to maximize throughput of the RPP-WTP, meet product quality, or ensure environmental protection.

- Diagnostics will be provided to reduce downtime (for instance, overload and emergency stop signals will be monitored by the control system).

- Control modes will be simplified and the scope of fallback and recovery control provisions will be reduced to contain operating costs.

- A plant information computer with data entry and reporting capabilities will be provided to support product quality and tracking requirements, and to provide process information needed for facilitating plant optimization.

- Provisions will be made for overview and scheduling information.

The RPP-WTP requires a combination of batch and continuous monitoring and control. Process equipment will be contained within cells, due to the radioactivity levels of the waste.

The mechanical handling aspects of the RPP-WTP will be, for the most part, at the final stages of processing, and will require sequential control of mechanical equipment. The mechanical handling equipment will be contained within caves. Since direct access to the plant and equipment will not normally be achievable, viewing of the equipment will be provided by viewing windows, closed circuit television, or both.

Process services, effluent and offgas treatment, and ventilation services will require sequence control for startup and shutdown, and continuous monitoring and control.

Figure 3-1. Location of the RPP-WTP on the Hanford Site

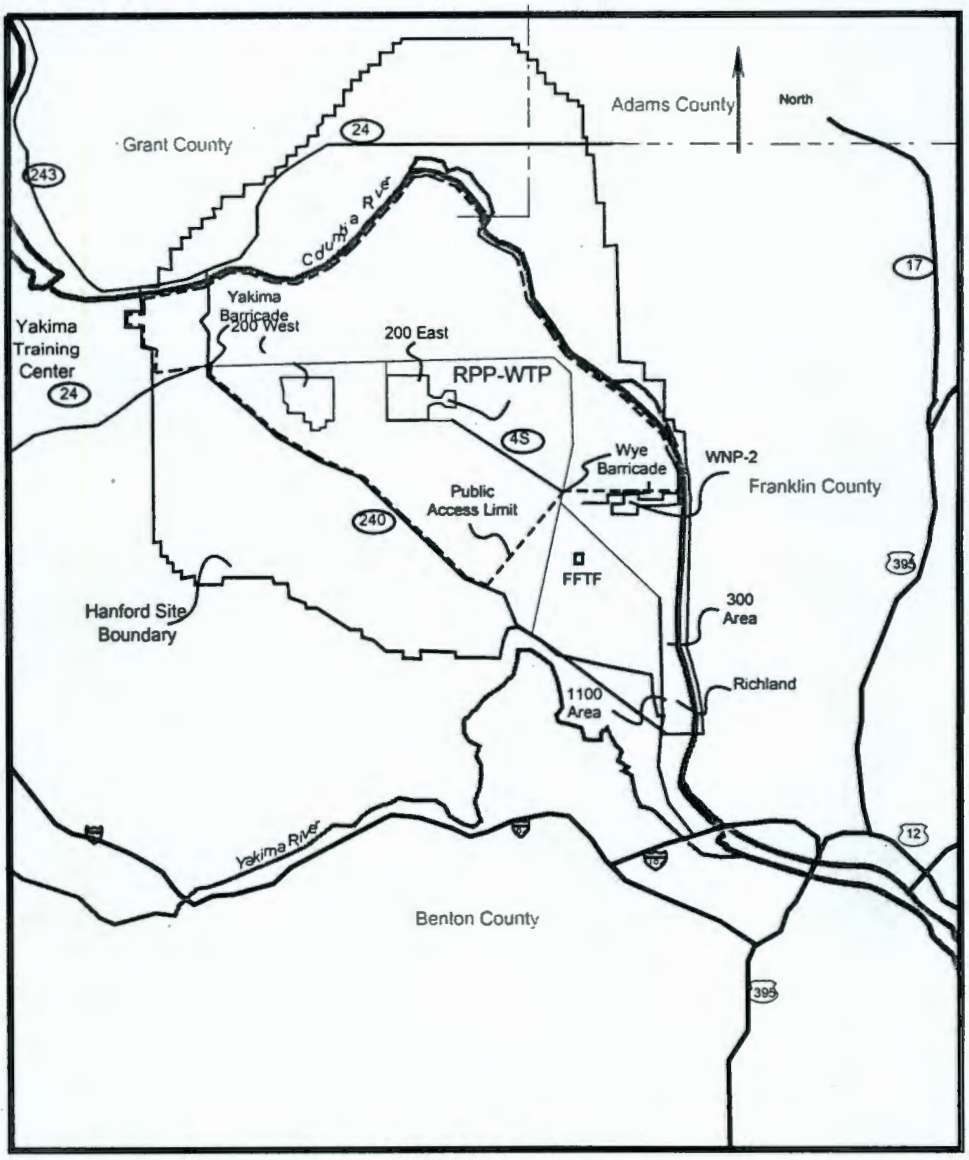


Figure 3-2. RPP-WTP Layout

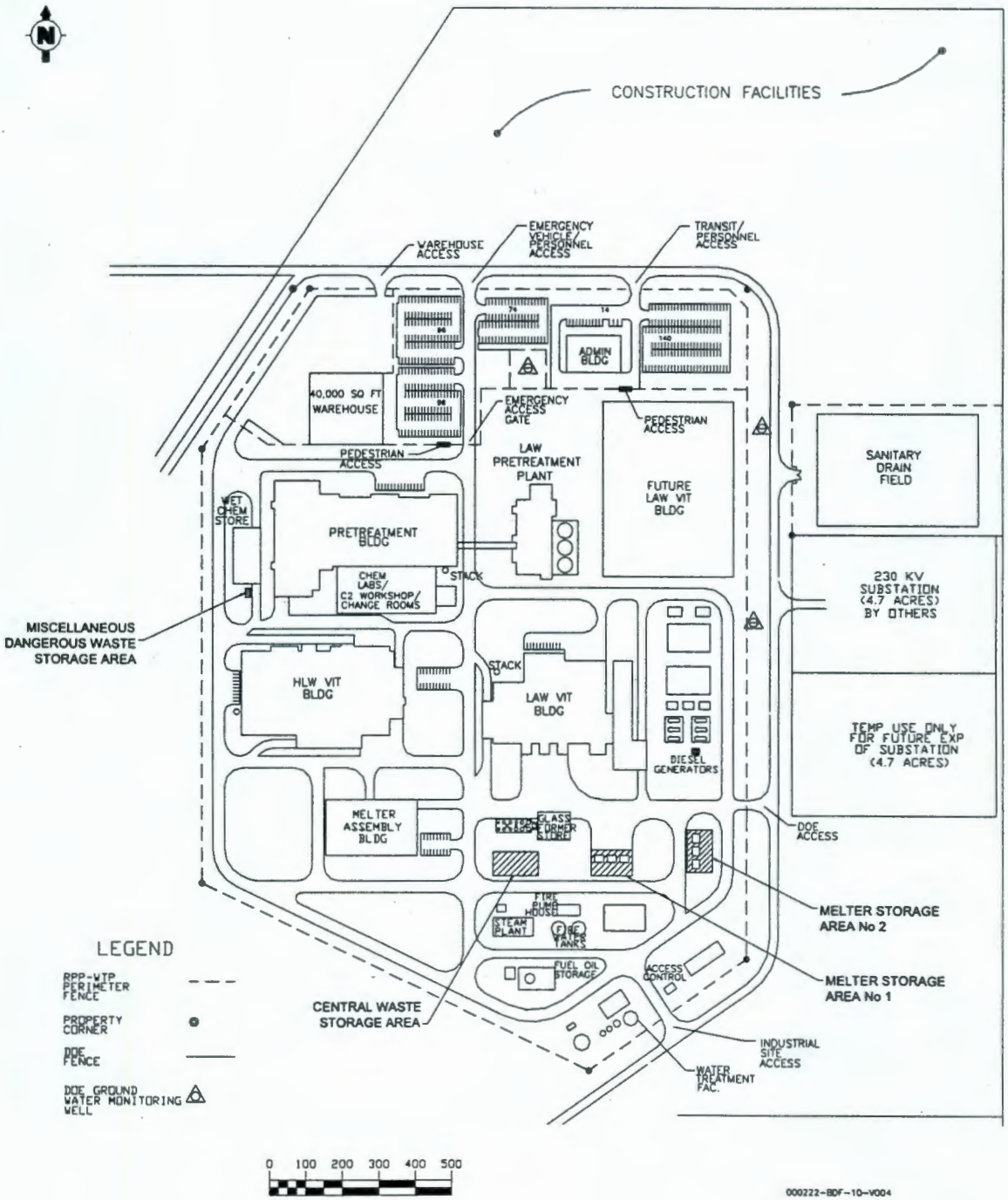
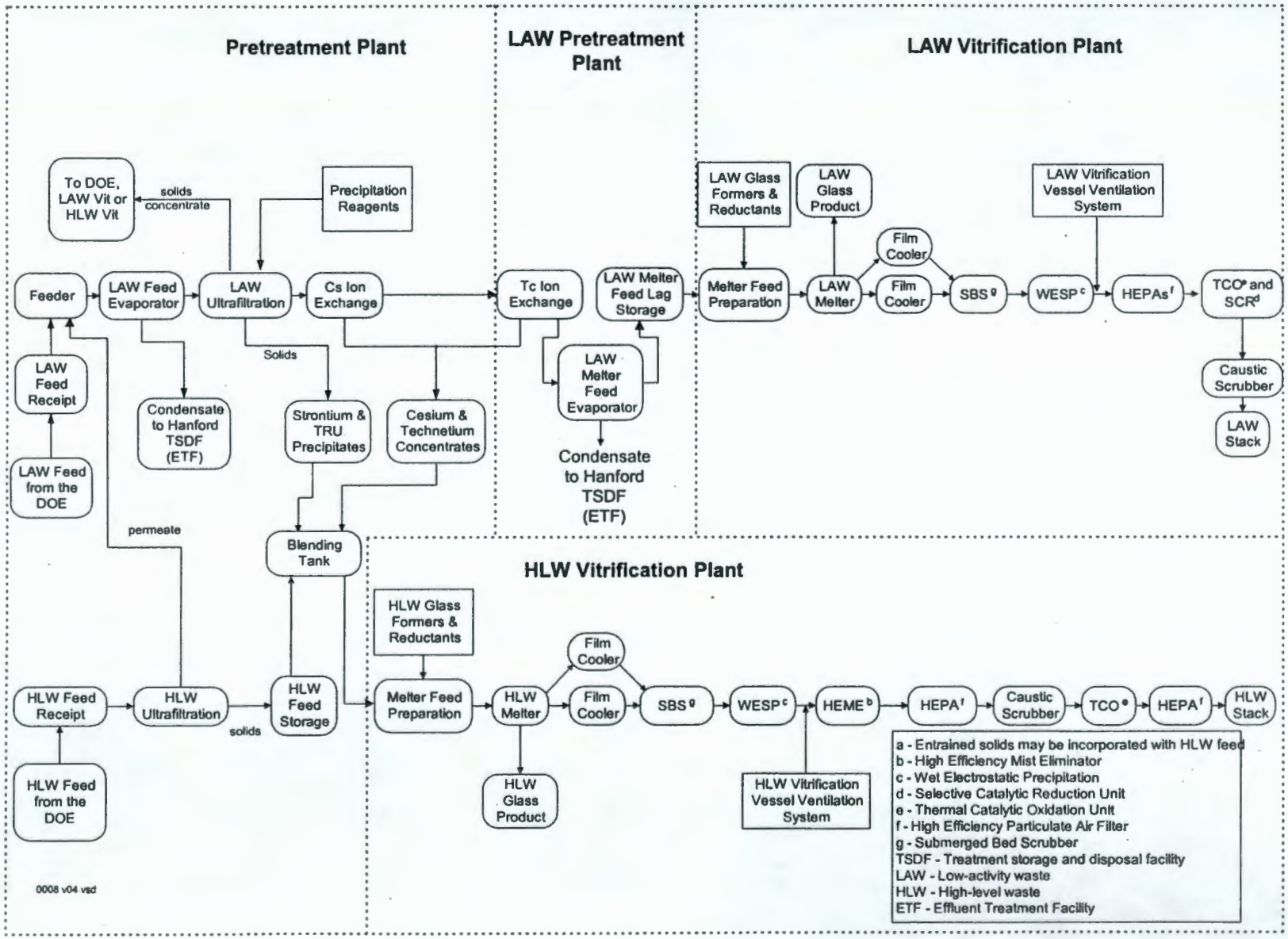



Figure 3-3. Process Flow Diagram