START

0022857

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 156707

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.		4. Date
Supplemental ☐ Direct Revision ☒ Change ECN ☒ Temporary ☐ Supersedure ☐ Discovery ☐ Cancel/Void ☐	E. G. Backlund/T5-54/3-2708		7/20/92
	5. Project Title/No./Work Order No. PFP/K6C2D	6. Bldg./Sys./Fac. No. PFP/24A	7. Impact Level 3EQ
	8. Document Number Affected (include rev. and sheet no.) WHC-SD-CP-PLN-010 Rev 0	9. Related ECN No(s). N/A	10. Related PO No. N/A

11a. Modification Work	11b. Work Package Doc. No.	11c. Complete Installation Work	11d. Complete Restoration (Temp. ECN only)
☐ Yes (fill out Blk. 11b) ☒ No (NA Blks. 11b, 11c, 11d)	N/A	N/A Cog. Engineer Signature & Date	N/A Cog. Engineer Signature & Date

12. Description of Change

This ECN modifies the PFP Wastewater Sampling and Analysis Plan, WHC-SD-CP-PLN-010, Rev 0, in its entirety.

The PFP Wastewater Sampling and Analysis Plan was revised to incorporate comments from the U.S. Environmental Protection Agency and the Washington Department of Ecology. The sampling data quality objectives were also revised to expand and clarify.

13a. Justification (mark one)	13b. Justification Details
Criteria Change ☐ Design Improvement ☐ Environmental ☒ As-Found ☐ Facilitate Const. ☐ Const. Error/Omission ☐ Design Error/Omission ☐	Incorporation of regulatory agency comments

14. Distribution (include name, MSIN, and no. of copies)

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DATE JUL 29 1992

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A-7900-013 (11/88)

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ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 156707

15. Design Verification Required	16. Cost Impact				17. Schedule Impact (days)
	ENGINEERING		CONSTRUCTION		
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☒ No	Savings ☐	$	Savings ☐	$	Delay ☐

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	☐	Seismic/Stress Analysis	☐	Tank Calibration Manual	☐
Functional Design Criteria	☐	Stress/Design Report	☐	Health Physics Procedure	☐
Operating Specification	☐	Interface Control Drawing	☐	Spares Multiple Unit Listing	☐
Criticality Specification	☐	Calibration Procedure	☐	Test Procedures/Specification	☐
Conceptual Design Report	☐	Installation Procedure	☐	Component Index	☐
Equipment Spec.	☐	Maintenance Procedure	☐	ASME Coded Item	☐
Const. Spec.	☐	Engineering Procedure	☐	Human Factor Consideration	☐
Procurement Spec.	☐	Operating Instruction	☐	Computer Software	☐
Vendor Information	☐	Operating Procedure	☐	Electric Circuit Schedule	☐
OM Manual	☐	Operational Safety Requirement	☐	ICRS Procedure	☐
FSAR/SAR	☐	IEFD Drawing	☐	Process Control Manual/Plan	☐
Safety Equipment List	☐	Cell Arrangement Drawing	☐	Process Flow Chart	☐
Radiation Work Permit	☐	Essential Material Specification	☐	Purchase Requisition	☐
Environmental Impact Statement	☐	Fac. Proc. Samp. Schedule	☐	N/A	☒
Environmental Report	☐	Inspection Plan	☐		☐
Environmental Permit	☐	Inventory Adjustment Request	☐		☐

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision

20. Approvals

Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog./Project Engineer: Ellison	7-20-92	PE	
Cog./Project Engr. Mgr: LR Garner	7-20-92	QA	
QA: [illegible]	7-21-92	Safety	
Safety		Design	
Security		Other: BBWilliamson for RJ Mackey	7/21/92
Proj.Prog./Dept. Mgr.: [illegible]	7/20/92		
Def. React. Div.			
Chem. Proc. Div.			
Def. Wst. Mgmt. Div.		DEPARTMENT OF ENERGY	
Adv. React. Dev. Div.			
Proj. Dept.			
Environ. Div.: RE Lerch	7-21-92	ADDITIONAL	
IRM Dept.		WHHarmsted	7/21/92
Facility Rep. (Ops): [illegible]	7-21-92		
Other: E.D. Backlund	7-20-92		
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ORIGINAL

Date Received: 7-29-92 CW

INFORMATION RELEASE REQUEST

Reference: WHC-CM-3-4

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Purpose (Check only one suffix)

- [] Speech or Presentation
  - [] Full Paper
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- [] Manual
- [] Brochure/Flier
- [] Software/Database
- [] Controlled Document
- [X] Other

ID Number (include revision, volume, etc.): WHC-SD-CP-PLN-010 Rev. 1

List attachments.

Date Release Required: 7-24-92

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Unclassified Category: UC-

Impact Level: 3E Q

New or novel (patentable) subject matter? [X] No [] Yes

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Will proceedings be published? [] Yes [] No

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Title of Journal

CHECKLIST FOR SIGNATORIES

Review Required per WHC-CM-3-4	Yes	No	Reviewer - Signature Indicates Approval: Name (printed)	Signature	Date
Classification/Unclassified Controlled Nuclear Information	[]	[]			
Patent - General Counsel	[X]	[]	BD Williamson	BD Williamson	7/24/92
Legal - General Counsel	[X]	[]	BD Williamson	BD Williamson	7/24/92
Applied Technology/Export Controlled Information or International Program	[]	[]			
WHC Program/Project	[X]	[]	LA Garner	LA Garner	7-23-92
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Publication Services	[]	[]			
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Information conforms to all applicable requirements. Yes [X] No []

The above information is cleared for release and has been approved.

References Available to Intended Audience [X] []

Transmit to DOE-HQ/Office of Scientific and Technical Information [] [X]

Author/Requestor (Printed/Signature) Date

E. G. Backlund E. G. Backlund 7/23/92

Intended Audience

[] Internal [] Sponsor [X] External

Responsible Manager (Printed/Signature) Date

L. A. Garner LA Garner 7-23-92

Stamp is required before release. Release is contingent upon resolution of mandatory comments.

APPROVED FOR RELEASE OFFICIAL DOCUMENT CW Date 7-28-92

Date Cancelled

Date Disapproved

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Part 1

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SUPPORTING DOCUMENT

1. Total Pages ~~30~~ ~~38~~ 39

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5. Key Words	6. Author
Wastewater Sampling and Analysis Plan	E. G. Backlund Name (Type or Print) E. G. Backlund Signature 15540 / K6C2D Organization/Charge Code

7. Abstract

This SAP was prepared for the Plutonium Finishing Plant Wastewater. The SAP establishes the requirements and guidelines used by Westinghouse Hanford Company in implementing an upgraded liquid effluent sampling program for the PFP wastewater. The SAP provides for representative sampling of the PFP Wastewater stream and accounts for expected variations in volumes andcontaminant concentrations due to facility operational conditions.

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9. Impact Level

3 EQ

10. RELEASE STAMP

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RECORD OF REVISION	(1) Document Number WHC-SD-CP-PLN-010	PAGE 1

(2) Title

Plutonium Finishing PlantWastewater Sampling and Analysis Plan

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change – Replace, Add, and Delete Pages	Authorized for Release		
		(5) Cog./Proj. Engr	(6) Cog./Proj. Mgr	Date
1 RS	(7) Rev 0, EDT 126224, dated September 25, 1991 Revised to incorporate comments from Ecology and EPA ECN 156707	E. A. Backlund	E. A. Backlund for L. A. Garner per telecon 7/23/92 2 PM	

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A. SAMPLING OBJECTIVES

A.1 Introduction

The *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) was signed by the Washington State Department of Ecology (Ecology), the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Energy (DOE) on May 15, 1989. Restrictions on the disposal of liquid effluents to the soil column at the Hanford site are found in Tri-Party Agreement Milestone M-17-00 and corresponding interim milestones. Sampling and Analysis Plans (SAP) are required for the 33 Phase I and Phase II streams that are discharged to the soil column. These SAPs are subject to the approval of EPA and Ecology.

A SAP was prepared for the Plutonium Finishing Plant (PFP) wastewater. The *Plutonium Finishing Plant Wastewater Sampling and Analysis Plan*, WHC-SD-CP-PLN-010, establishes the requirements and guidelines used by Westinghouse Hanford Company (Westinghouse Hanford) in implementing an upgraded liquid effluent sampling program for the PFP wastewater. It also provides for representative sampling of the PFP wastewater stream and accounts for expected variations in volumes and contaminant concentrations due to facility operational conditions. Revision 0 of the PFP SAP was submitted on September 30, 1991, to fulfill Tri-Party Agreement Milestone M-17-12A. This document, Revision 1 of the PFP SAP, incorporates comments from EPA and Ecology on Revision 0. Guidance from EPA and DOE-Headquarters on the establishment of Data Quality Objectives has also been incorporated into this document.

This SAP was prepared in accordance with requirements specified in the *Liquid Effluent Sampling Quality Assurance Program Plan* (QAPP), WHC-SD-WM-QAPP-011. The QAPP provides the Hanford Site guidelines and requirements for special high-quality liquid effluent sampling activities, which include the following: control of samples, laboratory analysis, processing of data, control of data, quality assurance requirements, and corrective actions used in obtaining high-quality data for the Liquid Effluent Sampling Program. The high-quality data is obtained from controlled grab samples, called "liquid effluent characterization samples," that are used to characterize the distribution of analytes in the effluent and to determine which analytes will require further monitoring in the future by the existing facility routine monitoring program.

The QAPP was written to allow each facility some flexibility in accommodating the Hanford Site requirements. One prime reason for flexibility is the differences in procedures for surveying radiation sources at each facility. The QAPP requirements for chain of custody, laboratory analysis,

validation of data, control of records, and corrective actions have not been modified by this SAP.

The SAP is a facility-specific document for describing the way the requirements of the QAPP shall be implemented for activities occurring at the facility. The SAP provides a general description of the procedures that will be used to execute the work needed to implement the QAPP requirements. The SAP identifies facility-specific exceptions to the QAPP, which include changes to the required list of analytes. In addition, the SAP describes the way in which the liquid effluent characterization samples and data will be integrated with the existing liquid effluent monitoring program (routine monitoring program).

The routine monitoring program was implemented to meet the requirements of the DOE Order 5400.1. The *Facility Effluent Monitoring Plan for the Plutonium Finishing Plant*, (WHC-EP-0476) was issued in November, 1991 and provides a detailed description of the routine monitoring program. The routine monitoring program complies with the requirements in the *Quality Assurance Project Plan for the Facility Effluent Monitoring Plan Activities*, WHC-EP-0446. The existing routine monitoring program will not be altered unless the liquid effluent characterization sampling in this SAP identifies a significant discrepancy in analyte concentration data as compared with the data obtained from routine monitoring.

A.2 Objectives

This SAP provides information on how sampling and analysis of the PFP wastewater will be performed to accomplish the desired objectives.

The primary objectives are to take care of immediate needs and to do the following.

- Collect data to evaluate the feasibility of use of historic sampling data for the characterization of PFP wastewater.
- Confirm the wastewater analytical data, as identified in the *PFP Wastewater Stream-Specific Report* (WHC-EP-0342, Addendum 8) were correct.

The secondary objectives are to take care of future needs and to do the following:

- Support performance verification of the PFP Wastewater Treatment Facility.

- Collect data to support preparation of the Washington Administrative Code (WAC) 173-216 permit application and the 173-240 engineering report for the Treated Effluent Disposal Facility.

- Collect data to support preparation of a groundwater impact assessment for continued discharge to the 216-Z-20 Crib to fulfill Tri-Party Agreement Milestone M-17-13.

- Support trend analysis and statistical evaluation of the wastewater.

- Collect data to support future remedial activities for the 216-Z-20 Crib.

Quality Assurance objectives for the sampling activities are described in the QAPP.

A.3 Approach

This SAP has been prepared to describe a program for obtaining high-quality sampling data that will identify the types and quantities of contaminants found in the PFP wastewater. The data will come from liquid effluent characterization samples that have quality controlled and verifiable methods for collecting the wastewater sample, transportation of the sample to the analytical laboratory, analysis of the sample, statistical evaluation of the analytical results, and the storage of sample records. Samples will be taken during a variety of operational configurations to ensure that representative samples are obtained.

Chemical analytes that are not detected will be eliminated from the list of analytes in future liquid effluent characterization samples. Chemical analytes found in both the wastewater and sanitary (potable) water at equivalent concentration levels will also be eliminated from the list of analytes. The amended analyte list shall be a Class 3 change to the SAP in accordance with the Tri-Party Agreement, as stated in the QAPP. A Class 3 change does not impact interim milestones, and requires approval of the assigned DOE and lead regulatory agency unit managers. A more complete definition of a Class 3 change may be found in Section 12.2 of the Tri-Party Agreement. Chemical analytes found to be consistently present in the PFP wastewater in significant measurable quantities shall be evaluated for addition to the list of analytes for the existing routine monitoring program. The document used for determining significance in amending the routine

monitoring program list of analytes is WAC 173-200, "Water Quality Standards for Ground Waters of the State of Washington."

An important pool of historical data is available from the routine monitoring program. These data provide information on soil column and process equipment solids loading for future remedial studies, treatment system design, and permitting documentation. The data from the routine monitoring program will also be used to evaluate the causes of seasonal, climatic, and operational variations in the quality of the wastewater. The SAP describes the existing routine monitoring program, which allows the accumulation of historical information and to provide a baseline data pool for comparing the reliability and validity of past data.

This SAP has been structured to obtain high-quality sampling data that will identify the types of contaminates found in the liquid effluent streams from PFP. The data will come from grab samples, liquid effluent characterization samples that have quality-controlled and verifiable methods for collecting the sample media, transporting the sample media, analyzing the media, statistically evaluating of the analytical results, and storing of sample records. All liquid effluent characterization sampling work shall be performed according to approved written procedures. The procedures shall comply with the requirements of *Test Methods for Evaluating Solid Waste*, EPA SW-846, latest revision.

All personnel associated with collection of liquid effluent characterization samples, processing of the samples, processing of the data, and control of records shall comply with the procedures related to their responsibilities. The personnel shall sign a document verifying that they have read and understand the procedures. The signed documents shall become part of the training records.

The liquid effluent characterization samples are grab samples because some constituents (volatile organics, ammonia) are unstable with time. Grab samples are used to minimize the hold time from sample collection to laboratory analyses to prevent a significant loss of these unstable analytes.

B. SITE BACKGROUND

B.1 PFP Facility Description

The Plutonium Finishing Plant is located in the 200 West Area of the Hanford Site. The PFP has two major processing areas: Plutonium Reclamation Facility (PRF) and Remote Mechanical "C" Line (RMC). Future activities at PRF will be limited to the recovery of plutonium from residual solids and liquid solutions left from previous processing activities. The residual liquids and solids will be treated in PRF to produce plutonium nitrate. The plutonium nitrate will then be processed in RMC to produce plutonium oxide, which is a stable compound that can be more easily stored until a decision is made on the ultimate use of the material.

The PFP consists of six major operations buildings, two major process chemical storage areas, two buildings in inactive status and a number of miscellaneous storage areas and workshops.

The major operations buildings are 234-5Z, 236-Z, 241-Z, 291-Z, 2736-Z, and 2736-ZB. The 234-5Z Building houses the active RMC Line and inactive Remote Mechanical "A" Line (RMA), Engineering and Development Laboratories, special nuclear material storage and handling facilities, various workshops, store rooms, offices, and locker rooms. Building 236-Z contains the PRF. Building 241-Z receives and acts as intermediate storage for liquid mixed wastes from RMC and PRF production processes. Equipment is housed in the 291-Z Building to handle the ventilation exhaust from the 234-5Z, 236-Z, and 242-Z Buildings. Special nuclear material handling operations are conducted in the 2736-ZB Building. Vaults for special nuclear material storage are in the 2736-Z Building. Buildings that are in inactive status are the 232-Z Incinerator Building and 242-Z Waste Treatment Facility.

B.2 Stream Description

The PFP wastewater consists of potentially contaminated, noncontact process cooling water from PRF and RMC; miscellaneous wastewater from laboratory activities; steam condensate; air conditioning condensate; and storm water runoff from south of the main PFP complex. This wastewater is discharged to 216-Z-20 Crib. All of the contributors for the PFP wastewater may become contaminated if there is a failure of primary engineered barriers. Secondary engineered barriers have been installed where there is a significant potential for failure and where the consequences of failure are great.

Wastewaters which are known to be contaminated or to contain mixed wastes are collected in the 241-Z Tanks and sent to the tank farms.

Process cooling waters are generated only when PRF is operating. These cooling waters will constitute approximately 20 percent of the total wastewater flow rate. PRF operations are conducted on a 5-day/week, 24-hour/day schedule. The wastewater generated when PRF is operating does not normally contact the process materials. Therefore, the wastewater will not contain contaminants from the process and the quality of the wastewater will not vary as the operating condition of PRF changes or from when the PRF process is not operating.

The bulk of the wastewater comes from heating, ventilation, and air conditioning (HVAC) activities. The PFP HVAC System is operated continuously to provide contamination control by isolating areas of both known and potential contamination in the plant. This wastewater does not contact process solutions. It has a very low potential for contamination. Additional wastewater is generated by seal/cooling waters from process vacuum systems and the continuous air monitoring system vacuum pumps. Also, storm water runoff contributes to the wastewater during precipitation events.

Appendix A of this SAP provides additional details on each wastewater contributor. Figure 1 shows these wastewater contributors. Appendix B contains a drawing that shows the buildings as well as the wastewater contributors and the sampling points.

Tri-Party Agreement Milestone M-17-16 requires that discharge of PFP Wastewater to 216-Z-20 Crib cease by June, 1995. This wastewater will be rerouted to the Treated Effluent Disposal Facility (TEDF) being constructed under Project W-049H. Prior to that rerouting, two closed-loop cooling systems will be installed at PFP; one for PRF, and the other for the HVAC equipment in the 291-Z Building. These closed-loop cooling systems will be installed by January 1994 under Tri-Party Agreement Milestone M-17-16D. A treatment facility will also be constructed to provide best available treatment (BAT) for the wastewater. This treatment facility will be operational by May 1994 under Tri-Party Agreement Milestone M-17-16E. The PFP wastewater and the planned upgrades were described in the *200 Area Treated Effluent Disposal Facility (Project W-049H) Wastewater Engineering Report* (WHC-SD-W049H-ER-003). The TEDF will be permitted under the State Waste Discharge Program (WAC 173-216).

PLUTONIUM FINISHING PLANT LIQUID EFFLUENT DIAGRAM

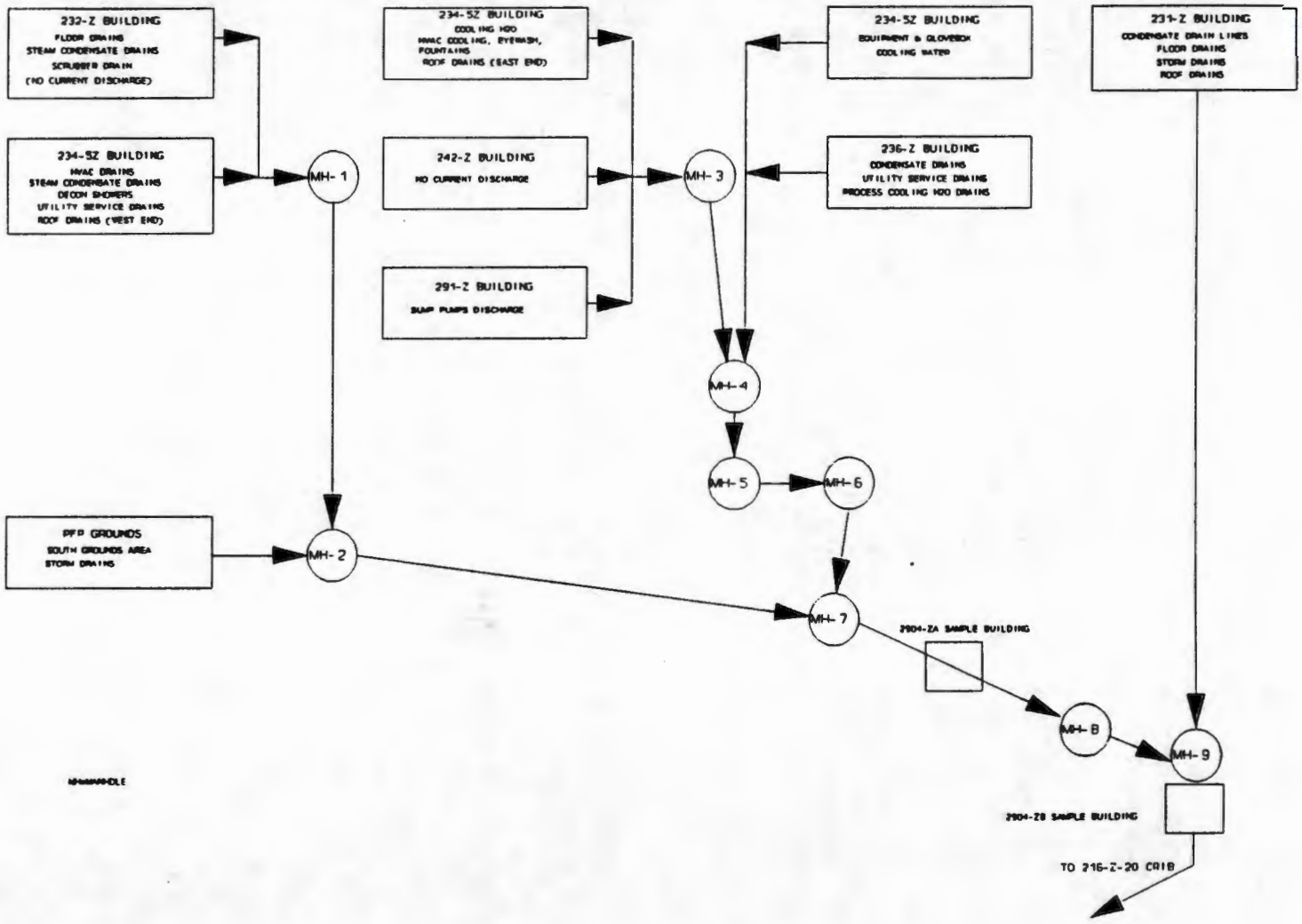

Figure 1

B.3 216-Z-20 CRIB DESCRIPTION

Crib 216-Z-20 was constructed in September 1981 and commissioned for receiving the PFP Wastewater in October 1981. The 216-Z-20 Crib is approximately 1,500 ft long and approximately 10 ft wide in cross section at the bottom.

Gravel was used to backfill the crib excavation to a depth of approximately 2.5 ft. Perforated pipes, which were connected to the building wastewater piping headers, were embedded in the gravel backfill to distribute wastewater discharges throughout the crib. A vapor barrier was placed above the gravel backfill. Soil was placed over the top to bring the area back to the surrounding grade.

Four groundwater monitoring wells are located adjacent to the crib, and are monitored quarterly. In addition, a new vadose zone well was recently installed adjacent to the crib. Liquid level in the crib is measured on a weekly basis through risers installed every 500 ft along the length of the crib.

C. RESPONSIBILITIES

The responsibility descriptions below are related to wastewater sampling activities occurring at PFP as described in this SAP. Overall responsibilities for other components of the sampling program are described in the QAPP.

Effluent Treatment Programs (ETP)

- Coordinate the overall program.
- Act as the liaison between facilities and RL.
- Prepare the Quality Assurance Program Plan.
- Provide the Program Manager.
- Manage input of validated data into the Liquid Effluent Monitoring Information System (LEMIS).
- Issue Liquid Effluent Characterization Annual Report to EPA and Ecology.

PFP Environmental Compliance

- Prepare the *Plutonium Finishing Plant Wastewater Sampling and Analysis Plan.*
- Ensure that procedures are prepared to support the sampling activities.
- Provide the Sampling Task Leader (Effluents and Regulatory Compliance Cognizant Engineer).
- Initiate scheduling of personnel required for sampling.
- Provide technical support for sampling activities.
- Review data logs and sampling activities.
- Oversee chain-of-custody activities at the facility.
- Reviews liquid effluent characterization sampling data for completeness and consistency, initiating corrective action if necessary.
- Provide flow data to Effluent Treatment Programs.
- File routine monitoring program sample data for PFP wastewater at the Environmental Data Management Center.
- Transmits validated data, from the liquid effluent characterization sampling, to Environmental Assurance for inclusion in the annual report of environmental releases, if requested
- Review the Liquid Effluent Characterization Annual Report.

The Office of Sample Management does the following:

- Validate the data for a Level B validation per "Data Validation for RCRA Analysis", WHC-CM-5-3, Section 2.0
- Select a laboratory for liquid effluent characterization samples.
- Transmit validated data packages to the EDMC.
- File sample chain-of-custody documentation.

The PFP Operations organization does the following:

- Provides a trained operator for escort during liquid effluent characterization sampling
- Provides sampling and transportation of routine monitoring program samples
- Completes sample log sheets for routine monitoring program samples
- Assists in moving liquid effluent characterization samples through radiation zone barriers

The PFP Health and Safety Organization does the following:

- Provides a Health Physics Technician (HPT) for radiation surveying of liquid effluent characterization sample packages
- Provides the Radiation Work Permit (RWP) instructions for zone entry
- Verifies radiation worker training requirements of sampling personnel
- Stops work if there is undue risk to health or safety

The Sampling And Mobile Laboratory organization does the following:

- Provides trained samplers for liquid effluent characterization sampling activities
- Provides at least one sampler shall have a WHC Certificate of Qualification from the Environmental Engineering Technology, and Permitting Group
- Prepares the PFP wastewater liquid effluent characterization sampling and packaging procedure
- Ensures that the certified sampler directs liquid effluent characterization sampling and packaging
- Documents sampling activities in a log book
- Transports liquid effluent characterization samples to laboratory or shipping center

- Initiates "chain-of-custody" documentation for liquid effluent characterization samples
- Packages liquid effluent characterization samples for shipping
- Ensures that copies of field logs and other sampling data sheets are filed with PFP Effluents and Regulatory Compliance cognizant engineer

The Quality Assurance (QA) organization does the following:

- Provides surveillance of the liquid effluent characterization sampling program
- Audits records and procedures
- Issues a stop work order if procedures are not being followed

D. SAMPLING LOCATION AND FREQUENCY

D.1 Sampling Location

Routine monitoring is performed continuously in the 2904-ZA and 2904-ZB sample buildings. Grab samples are taken at manhole number 4 only during periods of operation of PRF. The 2904-ZA sample building is located approximately 250 yards downstream of PFP at manhole number 7. This location was selected to monitor all PFP complex wastewater and give early warning of potential problems. The 2904-ZB sample building is located at manhole number 9, approximately 65 yards downstream of the 2904-ZA facility. This is the last manhole before the wastewater enters the crib and includes the wastewater contributors from the 231-Z Building. Manhole number 4 is located approximately 20 yards south of the 234-5Z Building and 10 yards west of the 236-Z Building. Manhole number 4 is immediately downstream of the Plutonium Reclamation Facility and was selected because it is the site that will provide the earliest warning of potential problems which may cause contamination of the wastewater. These sample locations are shown in Figure 1 and Appendix B.

Liquid effluent characterization samples will be taken at manhole number 9. Figure 1 and Appendix B show this manhole and the wastewater contributors. This location was selected to ensure that the sample includes all wastewater contributors to the discharge to the 216-Z-20 Crib. Flow is very turbulent in this manhole, ensuring that the wastewater is well mixed and the sample is representative. This manhole is the position furthest downstream where a

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sample may be taken and accurately represents the wastewater quality as it is discharged to the crib. The wastewater contributors (described in Appendix A) have been evaluated to ensure that dilution of concentrated sources of contaminants is not occurring upstream of manhole number 9. Sampling at manhole number 9 is appropriate to fulfill the objectives of this SAP.

D.2 Frequency

D.2.1 Routine Monitoring

Monitoring of total alpha activity, flow rate and pH of the wastewater is done on a continuous basis. A Manning Sampler in 2904-ZB is set to sample every 300 gallons (approximately every 3-5 minutes). The composite sample is deposited in a 5 gallon carboy and collected each day for total alpha activity and pH analysis. This sampling is named routine sampling. A portion of this sample is saved each day and collected for a monthly aggregate sample. When PRF is operating, samples will also be collected from the Manning Sampler each shift, and a grab sample will be taken at manhole number 4 each 8-hour shift and sent to the 222-S Laboratory for total alpha activity and pH analysis.

D.2.2 Liquid Effluent Characterization Samples

D.2.2.1 Sample Frequency Rationale

Sample frequency was established after evaluating future operational plans for PFP. The PFP is preparing for a Stabilization Campaign. During this campaign, reactive scrap materials will be processed through PRF and then the RMC line. This campaign will begin when the Operational Readiness Review process is completed.

Prior to initiation of the Stabilization Campaign, a Cold Run/Integrated Systems Checkout will be performed to provide performance-based operator training and evaluate process equipment. This PRF Training Run is scheduled for approximately 25 weeks. Operation of the PRF facility is planned for approximately 42 weeks. Reactive scrap materials will be processed to plutonium nitrate solution. Cooling water from 4 PRF cooling jackets and one Reflux Condenser will be discharged to the PFP wastewater during the Cold Run and during PRF operations. This will constitute approximately 12 - 15 gallons per minute.

Operation of the RMC line is planned for a duration of approximately 42 weeks. The plutonium nitrate solution from PRF will be processed to plutonium

oxide, a stable form for long-term storage. No additional wastewaters are generated from operation of the RMC Line. Accordingly, no special wastewater sampling is required during RMC Line operation.

D.2.2.2 Frequency Of Liquid Effluent Characterization Sampling

Liquid effluent characterization sampling will be initiated within three months after approval of this SAP.

Four liquid effluent characterization samples will be taken during the first year after implementation of this SAP, and four liquid effluent characterization samples will be taken during operation of PRF (if PRF operation does not commence within the first year of SAP implementation). The samples should be taken with approximately equal intervals between them to obtain a general time distribution which makes the samples representative of the seasonal variations. Thereafter, liquid effluent characterization sampling will be performed annually. The samples will be collected at random dates and times to obtain representative data.

At least one sample will be taken prior to initiation of the PRF Training Run to establish a baseline for wastewater quality in a non-operational mode. A total of four samples will be taken during the Cold Run/PRF operation to verify process knowledge about the wastewater quality.

A sample of the PFP sanitary (potable) water supply will also be taken during each sampling event and analyzed for the full set of analytes listed in section G of this SAP. This sample will be taken for the purpose of comparison with the wastewater samples to identify wastewater contaminants which are present in the supply water.

D.2.2.3 Frequency of QA/QC Sampling

Field duplicate samples, field blanks, and trip blanks will be taken during each sampling event. Field duplicate samples are samples taken at approximately the same time under identical conditions and preparation to verify the repeatability of sample collection, preservation, storage, and laboratory data. Field blanks and trip blanks are pure, deionized, distilled water samples used to check for possible contamination originating from the reagent, sampling environment, container preparation, shipment, handling, or storage. Equipment blanks are not necessary as samples are collected in a precleaned bottle on a stick. The duplicate samples and the blanks will be used to validate the laboratory data per section 2 of WHC-CM-5-3.

E. SAMPLE IDENTIFICATION

A unique sample number shall be provided for each sample. The routine monitoring program samples are labeled with a Sample Analysis Request form which has a four digit number assigned sequentially by PFP Facility Operations personnel for each sample. Additionally, each sample receives a four digit number preceded by an "S"; this number is assigned by 222-S personnel. The label also shows the date and time of sampling, as well as the sample location. An example of a routine monitoring program sample label is provided in Figure 2.

Liquid effluent characterization samples will be assigned a unique sample number by the Westinghouse Hanford Sampling And Mobile Laboratory personnel. The general numbering method will be as follows:

Z - 000000 -	00000	A
(Date)	(Seq. #)	(Bottle Letter)

The date portion of this number is comprised of the numeric date form of the month, day, and year. (The date is optional in abbreviation of reports and labels.)

The sequence number is the laboratory log book number control number.

The bottle letter indicates the sequential lettering of numbers used more than once during a single sampling event. (For single bottle samples, the bottle letter is optional.)

Sample labels for liquid effluent characterization samples will be provided by the sampling team from the Sampling And Mobile Laboratory. In addition, each bottle shall be identified with a bar code sticker attached to the bottle by the bottle manufacturer. The bar code shall identify the bottle lot number and individual bottle number.

The date and time of sample collection, the stream identification, the sampling location, identification of the person in charge of collecting the sample, preservative added, and the analysis to be performed on the sample will be included on the label with the unique identification number.

Routine Monitoring Program Composite Sample Label

PLUTONIUM FINISHING
SAMPLE ANALYSIS REQUEST

ANALYZE FOR:		
		[ ] LOI
[X] PU	[X] PH	[ ] EMISS. SPEC.
[ ] U	[ ] PHASES	[ ] MASS SPEC.
[ ] SP GR	[ ] % SOLIDS	[ ] C
[ ] H +	[ ] E O/A (ADJ)	[ ] WT. % PU
	[ ] E O/A (STP)	[ ] D.T.
[ ] Am	[X] ~~PRN~~ Total Alpha	[ ] FOR COMPOSITE

LAB. SER. NO.	TIME	DATE
S 3094	0845	7-7-95
TANK NO.	CODE	MATERIAL
2904 ZB	0673	AQ
REQUESTED BY		
234-5 Z		
REMARKS		
Composite		

A-6900-025 (R-10-78)

Figure 2

F. SAMPLING EQUIPMENT AND PROCEDURES

F.1. Routine Monitoring

Routine monitoring of PFP wastewater for pH, total alpha activity and flow rate is performed in the 2904-ZA and 2904-ZB Sample Buildings .

The pH of the wastewater is measured continuously by a Leeds and Northrup meter in the 2904-ZB building. This monitoring is performed to ensure that the wastewater is discharged within the limits imposed by internal Westinghouse Hanford guidelines and requirements, as well as DOE Orders. The pH monitor is capable of monitoring a pH level from 1 to 14 and alarms if the pH level goes below 6 or above 9. Calibration of the pH monitor is done on a quarterly basis.

The Manning Sampler in the 2904-ZB Building collects a composite sample daily which is analyzed for total alpha activity. An aliquot of this sample is also composited for a monthly sample, which is analyzed for specific isotopes of concern (plutonium-238, 239, and 241; americium-241, cesium-137, and strontium-90). Continuous gross alpha activity is monitored by an on-line alpha monitor (OLAM) at the 2904-ZA building. The OLAM provides a continuous readout of alpha activity in the wastewater and is used to provide an early warning of potential problems. Calibration of the Manning Sampler and the OLAM is done on an annual basis.

Grab samples are taken at manhole number 4 during PRF operation using a bottle on a stick similar to the SW-846, Figure 9-11, dipper. The procedure specifies a 250 milliliter wide mouth polyethylene bottle and a sampling dipstick.

Flow is measured and totalized in the 2904-ZB building. A Palmer-Bolus flume sends a signal to a recorder which will record the flow on a date- and time-stamped paper strip chart. Calibration of the flowmeter is done twice a year.

F.2. Liquid Effluent Characterization Samples

Liquid effluent characterization samples will be grab samples taken at manhole number 9 using a bottle on a stick similar to the SW-846, Figure 9-11, dipper. The PFP procedure for liquid effluent characterization sampling will specify use of a long-handled dipstick (i.e., a metal rod) for lowering the bottle. Sample bottles shall be commercially available certified precleaned glass or plastic bottles.

The sampling procedure will identify PFP-specific sampling requirements, which include the following:

- Sampling location
- A description of sampling equipment, containers, and reagents
- Safety precautions, including personnel protective equipment
- Specific steps for collecting the sample
- Instructions for completing field notebook entries, sample labels, and sample chain of custody forms.

General Hanford Site sample handling and data management requirements will be specified in procedures as identified in the Section 5.1 of the QAPP.

Field logs will be completed per the "Environmental Investigations and Site Characterizations Manual", WHC-CM-7-7, procedure EII 1.5 "Field Logbooks", during the sampling event. The logbook shall contain information pertinent to the sampling, including any intermittent sources at the time of sampling. A fuller discussion of pertinent information may be found in 6.1 of WHC-SD-WM-QAPP-011.

The sampling procedure will be reviewed prior to each subsequent sampling event and updated as necessary.

G. SAMPLE HANDLING AND ANALYSIS

G.1. Routine Monitoring

The Manning Sampler collects a composite sample of the PFP wastewater. An aliquot of this sample is transferred each day to a clean polyethylene bottle. This bottle is surveyed by an HPT. The sample is transported to the 222-S Analytical Laboratory for total alpha activity and pH analysis. Total alpha activity analysis is normally reported in less than eight hours. A duplicate aliquot from the composite sample is collected, saved, and consolidated into a monthly aggregate sample. The monthly aggregate sample is analyzed for plutonium-238, 239, 241; americium-241, cesium-137; and strontium-90.

At manhole number 4, the sample is collected in a clean polyethylene bottle. The sample is handled as described above for the composite sample, but no aliquot for monthly aggregate is taken.

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Routine monitoring program sample data will be sent to the Environmental Data Management Center on a semi-annual basis. The data will be part of the administrative record for the Tri-Party Agreement milestone for PFP wastewater, M-17-16. The PFP Environmental Compliance Manager will maintain the chain-of-custody records for routine monitoring program samples.

G.2. Liquid Effluent Characterization Sampling

Liquid effluent characterization samples will be analyzed for the following:

- Sulfides, EPA method 9030
- Semi-volatile organics (semi-VOA), EPA method 8270
- Volatile organics (VOA), EPA method 8240
- Herbicides, EPA method 8150
- Organophosphorous Pesticides, EPA method 8140
- Polychlorinated biphenyls (PCB)/organochlorine pesticides, EPA method 8080
- Tin, EPA method 7870
- Mercury, EPA method 7470
- Hexavalent Chromium, EPA method 7196
- Inductive coupled plasma (ICP) metals, EPA method 6010
- Total oil and grease, EPA method 413.2
- Chemical oxygen demand (COD), EPA method 410.4
- Sulfate, EPA method 375.4
- Nitrate, EPA method 353.3
- Alkalinity, EPA method 310.1
- Total dissolved solids (TDS), EPA method 160.1
- pH, EPA method 150.1
- Conductivity, EPA method 120.1

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- Total alpha/beta, no standard method
- Plutonium-238, 239, 241; americium-241; strontium-90; cesium-137, no standard method

G.2.1 Rationale for Liquid Effluent Characterization Sample Analyte Selection

These analytes were selected based on constituents known or suspected to be associated with the wastewater. They were chosen to fulfill the Data Quality Objectives from section A.2 of this SAP, and after review of data from past characterization activities, especially sampling for the *PFP Wastewater Stream Specific Report* (WHC-EP-0342, Addendum 8).

Conductivity, pH, sulfate, nitrate, sulfides, and metals were selected since they give a good indication of overall wastewater quality. Mercury was selected as an analyte because it was detected in one sample taken for the PFP Wastewater Stream Specific Report. It is believed to be an anomaly, so future sampling should confirm the absence of mercury in the wastewater. Volatile and semi-volatile analyses were selected to confirm that volatile and semi-volatile constituents used in process solutions are not present in the wastewater.

Radionuclide analysis for plutonium-238, 239, 241; americium-241; strontium-90, cesium-137, and total alpha/beta will provide information on radionuclide content of the wastewater at the time sampling was performed and will provide a basis for comparison against routine monitoring program data. These radionuclides will be analyzed by the selected analytical laboratory's method, as there is no prescribed standard method.

Analysis for PCBs, pesticides, and herbicides was directed by EPA and Ecology to provide complete characterization of the wastewater in accordance with 40 Code of Federal Regulations (CFR) 264, Appendix IX . Analysis for TDS, total oil and grease, COD, alkalinity, were added to provide data necessary for the WAC 173-216 permit process for the Treated Effluent Disposal Facility.

Analyses for biological oxygen demand (BOD), fecal coliform, and total coliform will not be performed on the liquid effluent characterization samples. The PFP Wastewater does not include any sources of sanitary wastewater. Therefore, analysis for biological contaminants such as BOD, fecal coliform and total coliform is not mandated. Acidity analysis will not be performed as the pH of this stream is above 7.

The handling and preparation of samples will comply with the procedures found in the "Environmental Investigations and Site Characterization Manual ", WHC-CM-7-7. The chain of custody shall comply with the procedure WHC-7-7, EII 5.1 "Chain of Custody ". Preparation of samples for shipment to a laboratory shall comply with EII 5.11 "Sample Packaging and Shipping".

The temperature and data from the continuous pH monitor will be recorded in the field notes.

G.2.2 Liquid Effluent Characterization Sample Handling

Liquid effluent characterization samples will be collected in commercially available, individually certified, precleaned glass or plastic bottles. The certification of the precleaned condition shall accompany the bottle. The sample volumes and number of containers are prescribed by the analytical laboratory and are subject to change. Tentative container types, and preservatives are as follows:

1. A 120-ml plastic container, containing 2-ml 6M sodium hydroxide and 2-ml of 1 wt% zinc acetate for preservative, for sulfides.

2. Four 1-liter amber glass containers with tetrafluoroethylene-lined caps, for semi-volatile organics, filled without bubble formation and with no head space.

3. Two duplicate 40-ml amber glass containers with tetrafluoroethylene-lined septum caps, for volatile organics, filled without bubble formation and with no head space.

4. Three 120-ml amber glass bottle, with tetrafluoroethylene-lined caps, with no preservatives, for herbicides, organophosphorous pesticides, organochlorine pesticides, and PCB's.

5. A 120-ml plastic container containing 1-ml nitric acid as a preservative, for tin.

6. A 250-ml plastic container with tetrafluoroethylene-lined cap, with 0.5-ml nitric acid, for inductive coupled plasma metals and mercury.

7. A 500-ml plastic container with tetrafluoroethylene-lined cap, having no preservative, for hexavalent chromium

8. A 1-liter glass container, with a tetrafluoroethylene-lined cap, with 5-ml hydrochloric acid for preservative, for total oil and grease.

9. A 60-ml plastic container, adjusted with sulfuric acid to a pH<2 for chemical oxygen demand.

10. A 60-ml plastic container, having no preservative, for sulfate.

11. A 120-ml plastic container, adjusted with sulfuric acid to pH<2, for nitrates.

12. A 120-ml plastic container, having no preservative, for alkalinity.

13. A 120-ml plastic container, having no preservative for total dissolved solids.

14. A 125-ml plastic container, having no preservative, for pH.

15. A 120-ml plastic container, having no preservative, for conductivity.

16. A 1-liter plastic container with tetrafluoroethylene-lined cap; adjusted to a pH <2 by nitric acid; for plutonium-238, 239, 241; americium-241, strontium-90, and cesium-137; and total alpha and total beta.

Preservatives required above will be vendor-supplied and added to the containers in the field. The caps will be sealed to the containers with tamper-evident tape. The containers will be labeled, then individually bagged and re-bagged. The outer bag will be taped with tamper-evident tape. The samples will be refrigerated at 4 degrees Celsius until ready to ship, and will then be placed in a cooler containing ice.

Sample bottles will also be prepared for field quality control samples. Each "X" in the table below identifies the analytes to be evaluated for each field quality control sample. Sample bottles will be prepared as noted above.

Parameter	Duplicate	Field Blanks	Trip Blanks	Sanitary Water
Sulfides	X			X
Semi-VOA	X			X
VOA	X	X	X	X
Herbicides	X			X
PCBs/Pesticides	X			X
Tin	X			X
Mercury	X			X
Chromium	X			X
ICP Metals	X			X
Oil and Grease	X			X
COD	X			X
Sulfate	X			X
Nitrate	X			X
Alkalinity	X			X
TDS	X			X
pH	X			X
Conductivity	X			X
Alpha/Beta	X			X
Radionuclides	X			X

Field notes will be kept by sampling personnel who will identify date, time, weather conditions, Plant operational status, and any other relevant information from each sampling event. The field log for each sampling event will identify which intermittent wastewater contributors are operating.

A chain of custody form will be filled out at the time of bottle preparation (preservative addition and pre-labeling) and will accompany each sample. A sample may consist of several containers. The chain-of-custody will account for each container and may be filled out for a maximum of 20 containers or one cooler. Once the sample has been drawn, it must be in the physical control or view of the custodian, locked in an area where it can not be tampered with, or prepared for shipping with tamper-evident tape applied. The definition of physical control includes being in the sight of the custodian, being in a room which will signal an alarm when entered, or being locked in a cabinet.

When more than one person is involved in sampling, one person alone shall be designated to sign as sampler. The sampler is the custodian until the samples are transferred to another location or group; he or she shall sign when releasing the samples to the designated receiver. Any private carrier used to transport the samples and chain-of-custody documentation shall be bonded.

The liquid effluent characterization samples will be routed to an approved Westinghouse Hanford Company participant contractor or subcontractor laboratory for analysis consistent with SW-846 requirements.

The data will be considered representative so long as at least 90 percent of the data points meet the established requirements in the laboratory contract for precision and accuracy. Data which does not meet this objective will be reviewed to determine whether the data can be used or whether corrective action should be taken. Corrective action measures are described in Section 14.0 of the QAPP. If necessary, corrective action will consist of repeating the sampling and/or analysis activity. Validated data will be sent by OSM to the Environmental Data Management Center. The data will be part of the administrative record for Tri-Party Agreement Milestone M-17-16. An electronic database (LEMIS) for management of this data is being developed and will be accessible by EPA and Ecology.

All sampling and analytical data will be maintained by the sampling task leader as quality records. The field logs will be maintained by Sampling and Mobile Laboratories. Copies of the Sample Analysis Request Form, Chain-of-Custody, and activity screening results will be sent to the Office of Sample Management (OSM). The original shipping papers will accompany the sample. Copies of the Sample Analysis Request form and chain-of-custody form will be returned to OSM from the laboratory after the samples are received. The original shipping papers will be kept by the laboratory, and the copies maintained by OSM.

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APPENDIX A

PFP WASTEWATER CONTRIBUTOR EVALUATION

The following are terms frequently used in this document:

Enclosed Drains An enclosed drain is totally enclosed from the its source to the floor coupling. The pipe is either welded or fixed in place. This type of drain is used for HVAC drains and glovebox or equipment cooling water drains.

Open Drains An open drain has an opening to the room, either as a sink, drinking fountain, or floor drain. Open drains also include funnel drains that act as a junction for several smaller contributors and open stand pipes. It is possible for chemicals to enter the wastewater through these drains. To prevent this from happening all open drains are posted with a sign warning against disposing of chemicals in these drains. In addition, personnel are trained in the proper disposal of chemicals and the chemicals are typically kept in enclosed cabinets or are stored on secondary spill containment pallets.

HVAC Drains These drains are typically found above any laboratory room that requires exact temperature control. The HVAC units use cooling water and also produce condensate from the atmosphere. No chemicals are used in these units and the wastewater contributors are essentially clean water. The cooling water is circulated through a non-contact heat exchanger. Cooling water and condensate are discharged through separate drains.

Equipment Cooling Drains Some electrical equipment requires cooling water. These cooling units also use non-contact cooling and discharge clean wastewater. Some pumps use water to form a seal to maintain a vacuum. The wastewater is discharged after use.

Terms frequently used (continued):

Glovebox Drains Gloveboxes are used throughout PFP for working on potentially contaminated materials. The glovebox will usually contain one or more processes and their support piping. Any cooling water required in a glovebox will use a non-contact heat exchanger. The cooling water does not come in contact with any contaminated material while in the glovebox.

Backflow Preventers Process water backflow preventers are a safety measure installed in the lines to prevent contaminated water from backing up into the sanitary (potable) water supply. A sudden change in water pressure will divert the water to the wastewater drain. The drain is an open standpipe located below a valve that diverts the water. This places the drain off the floor away from potential chemical spills.

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MANHOLE NUMBER 1

Manhole Number 1 receives wastewater from the inactive 232-Z Incinerator building, and from the west end of the 234-5Z building duct level and 2nd floor. Routine wastewater flow to Manhole Number 1 from 234-5Z wastewater contributors is estimated to be 4 gallons per minute (GPM).

232-Z Building

Processing activities in this building were suspended in 1972. The water is turned off in Building 232-Z and no chemicals are stored or used in the building. There are no routine contributions from 232-Z to manhole number 1. Potentially contaminated wastewater contributors are disconnected.

234-5Z Building, Duct level

Wastewater contributors from the duct level consist of four equipment cooling water discharges, three process water backflow preventers, and eight safety showers. The cooling water drains are enclosed drains and the equipment is not connected to any radiological processes. The backflow preventers have open drain pipes; however, no chemicals are stored or used nearby. The safety showers only have a potential for chemical release to the wastewater if one is used for personal safety during an emergency which involves chemical contamination.

Radiological contamination of these wastewater contributors is unlikely.

234-5Z Building, 2nd level

The second level contributors can be divided into two groups: ventilation drains and Chemical Preparation (CHEMPREP) drains. The ventilation section of the second floor has six floor drains, one drinking fountain, and four HVAC condensate drains. There are no chemicals stored near the floor drains or the drinking fountain. It is unlikely that a chemical discharge could occur at the HVAC drains, since these funnel drains are off the floor on standpipes and there are no chemicals stored or used in the immediate vicinity.

Radioactive contamination entering the wastewater is only possible through the six floor drains in the ventilation section. All ventilation floor drains located in a radiation zone will be plugged as part of an effort to control the wastewater quality.

MANHOLE NUMBER 1 (cont.)

The two CHEMPREP rooms for the RMC line are located in a non-radiation zone and contain two sinks, and two backflow preventers. The CHEMPREP tanks are situated over a large sump that drains to the 2735-Z chemical overflow tank. Chemical spills from the tanks will not enter the PFP wastewater. The sinks are labeled with a warning against disposing of chemicals in them and have been temporarily plugged as an added measure of safety. Five floor drains are located outside of the CHEMPREP tanks sump area, which is under the CHEMPREP tanks. The five floor drains have been permanently sealed to prevent spills from entering the 216-Z-20 crib. The sanitary (potable) water backflow preventer has been routed to the sump and the hot water backflow preventer discharges to one of the sinks. Both of the CHEMPREP sinks will be disconnected from the 216-Z-20 crib.

Wastewater contributors from the east end of the second floor consist of one HVAC drain and two floor drains. The HVAC condensate drain has enclosed piping. The two floor drains are in the instrument repair shop. Chemicals used in the shop are stored in a flammable proof storage cabinet. All three effluent sources are located in the uncontaminated portion of the building.

234-5Z Building, Roof Drains

The roof drains only receive storm water. No chemicals are stored or used on the 234-5Z building roof. There is no radioactive contamination on the roof.

MANHOLE NUMBER 2

Manhole number 2 receives runoff from the storm drains located on the south side of the plant. The paint shop is located near one of the storm drains so all painting supplies and solvents are kept in locked flammable proof cabinets. There are no routine wastewater contributions from manhole number 2.

MANHOLE NUMBER 3

Manhole number 3 receives wastewater from the 291-Z Exhaust Fan House; the inactive 242-Z Waste Treatment and Americium facility; the 234-5Z 1st floor cold chemical and clean water drainage; and the east end of the 234-5Z duct level, second floor, and roof drains. Routine wastewater flow to manhole number 3 from 234-5Z wastewater contributors is estimated to be 2 GPM. Routine wastewater flow to Manhole Number 3 from 291-Z wastewater contributors varies between 20 GPM and 50 GPM depending on the time of year.

291-Z Exhaust Fan House

This building houses the main exhaust fans, the instrument air compressors, as well as several pumps and equipment. All of the compressor condensate and pump seal water are sent to open floor drains as clean water. The only chemicals used near the drains include nonhazardous cleaning agents and motor oil.

242-Z Waste Treatment and Americium Facility

Processing activities were suspended in this building in 1976. The water is turned off in Building 242-Z and no chemicals are stored or used in the building. There are no routine wastewater contributions from 242-Z to manhole number 3. Contamination entering the wastewater from this building is unlikely.

234-5Z Building, First Floor

Wastewater contributors from the first level consist of two drinking fountains, one sink, two eye wash stations, three equipment cooling water drains, and two glovebox cooling water drains. The equipment and glovebox cooling water drains are enclosed drains. All other drains are open but are not near where chemicals are used or stored.

Potentially radioactive contaminated contributors include the glovebox cooling water drains and the equipment cooling water drains. These units use non-contact cooling systems.

234-5Z Building, Duct level

Wastewater contributors from the east end of the duct level consist of four HVAC condensate drains and one equipment cooling water drain. The HVAC condensate and equipment cooling water drains all have enclosed piping.

Chances for radioactive contamination are minimal.

MANHOLE NUMBER 3 (cont.)

234-5Z Building, Second level

Wastewater contributors from the east end of the second floor consist of one HVAC drain and three floor drains. The HVAC condensate drain has enclosed piping. There are no chemicals stored near the floor drain in the ventilation room. The other two floor drains are in the instrument repair shop. Chemicals used in the shop are stored in a flammable-proof cabinet.

The entrance of radioactive contamination into PFP wastewater is only possible through the floor drain in the ventilation room. All ventilation room floor drains located in a radiation zone will be plugged as part of an effort to control the wastewater quality.

234-5Z Building, Roof Drains

The roof drains only receive storm water. No chemicals are stored or used on the 234-5Z building roof. There is no radioactive contamination on the roof.

9 2 1 2 6 5 5 2 0 2 7

MANHOLE NUMBER 4

Manhole number 4 receives wastewater from 234-5Z process cooling water drains, 236-Z process cooling water drains, 236-Z steam condensate drains, and 236-Z waste water drains. Routine wastewater flow to manhole number four from 234-5Z wastewater contributors is estimated to be 1 GPM. Routine wastewater flow to manhole number 4 from 236-Z wastewater contributors is estimated to be 13 GPM. Wastewater flow from 236-Z during PRF operation is estimated to be an additional 12 GPM.

234-5Z Building

Wastewater contributors originate from either the analytical or development laboratories or from the RMC line or the inactive RMA line. There are four glovebox cooling water drains in the production lines (all are inactive), one drinking fountain in the RMC control room, and one equipment cooling water drain on the duct level. The glovebox and equipment drains are totally enclosed and chemicals are not stored or used in the RMC control room. The equipment with potentially contaminated cooling water has been made inactive and is no longer used. These contributors will be physically isolated from the PFP wastewater.

The analytical laboratory has one sink and one HVAC drain line. The HVAC drain line has two open drains on it and collects the cooling water and condensate from six contributors, four air conditioners, one cold water overflow drain, and the compressed air condensate trap. A warning sign has been posted above each opening. The sink is located in the "clean" lab. This room is used only for nonradioactive laboratory work. All the hazardous chemicals are stored in special cabinets situated away from the sink. The sink is clearly labeled against disposing of any chemicals in it.

The cold (non-radioactive) development lab contains three lab sinks, one eyewash station, one equipment cooling water drain on the duct level, and one backflow preventer drain on the duct level. All the drains are clearly labeled against disposing of chemicals in them. Hazardous chemicals in this room are stored in chemical storage cabinets.

236-Z Building, First floor

Wastewater contributors from the first floor of the 236-Z Building consist of one drinking fountain, two fire water drains, and ten glovebox cooling water drains. The glovebox drains and the fire water drains are enclosed. The drinking fountain has been labeled against the disposing of chemicals into the drain. The processing cooling water is run through a non-contact cooler. This greatly reduces the possibility of contamination.

MANHOLE NUMBER 4 (cont.)

236-Z Building, Second floor

The second floor of the 236-Z building contains no wastewater contributors.

236-Z Building, Third floor

The third floor of the 236-Z building contains fifteen steam condensate drains, five process water backflow preventers, one floor drain, three ventilation equipment drains, and one process water overflow drain. There are no chemicals stored on this floor. The steam condensate drains are enclosed drains. All other drains are open and have been labeled against disposing of chemicals in them. The only potential sources of contamination are the 17-inch vacuum pump seal water discharges.

236-Z Building, Fourth floor

The fourth floor of the 236-Z Building contains one drinking fountain, one HVAC condensate drain, and nine glove box cooling water drains. The glovebox drains are enclosed drains as is the HVAC condensate drain. The drinking fountain is located in the PRF control room. No chemicals are stored or used in the control room. All glovebox cooling units use non-contact cooling to reduce the possibility of contamination.

236-Z Building, Sixth floor

The sixth floor of the 236-Z Building contains one process water backflow preventer. There are no chemicals stored on this floor.

MANHOLE NUMBER 9

Manhole number 9 receives the wastewater from the 231-Z building. Routine wastewater flow to manhole number 9 from 231-Z Building contributors is estimated to be 2 to 4 GPM.

231-Z Building, First floor

Wastewater contributors from the first floor of the 231-Z Building consist of one air conditioner and one drain riser. The air conditioner is an open drain but will be changed to an enclosed piping configuration. The drain riser has a metal cover which can be locked in place. The riser is located in the carpenter's shop and will be removed and plugged in the future.

231-Z Building, Second floor

The second floor contains all the HVAC systems for the 231-Z building except for the inactive supply fan on the first floor. There are six drains to remove steam condensate from the ventilation, five steam traps, and three PNL vacuum pumps that discharge seal water. All piping on this floor is enclosed with no chance of radiological contamination entering the crib from this source.

STREAMS DRAIN TO 216-Z-20 TILE FIELD

HIGH LEVEL SALT WASTE TO TANK FARM

STORM SEWER TO 216-Z-21 BASIN

SANITARY SEWER

ROOM 336-337, FROM 234-5Z CHEMICAL PREPARATION
CHEMICAL WASTE SEWER DRAIN

DRAIN HEADER CONTENTS DESCRIPTION

COLD CHEMICAL AND NONCONTAMINATED PROCESS WASTE DRAIN

COLD PROCESS COOLING WATER AND CONDENSATE DRAIN

PROCESS COOLING WASTE DRAIN (POTENTIALLY CONTAMINATED)

LOW SALT WASTE DRAIN

LOW SALT WASTE DRAIN 234-5Z

HIGH SALT WASTE DRAIN 236-Z

LOW SALT WASTE DRAIN

LEGEND

CB	CATCH BASIN
MH	MANHOLE
CO	CLEAN OUT

WHC-SD-CP-PLN-010 REV. 1

APPENDIX B

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DRAWING APPROVALS	DATE
APPD FOR QUALITY ASSURANCE	
APPD	
DESIGN MANAGER	
APPD	
DESIGN ENGINEER HH IRBY	
DRAFTING APPD	
CHECKED	
DRAWN P.L. MOORE	
CADFILE B097310A	
CAD CODE 1C:IBM:ACD2:11:SN	

U. S. Department of Energy
Richland Operations Office

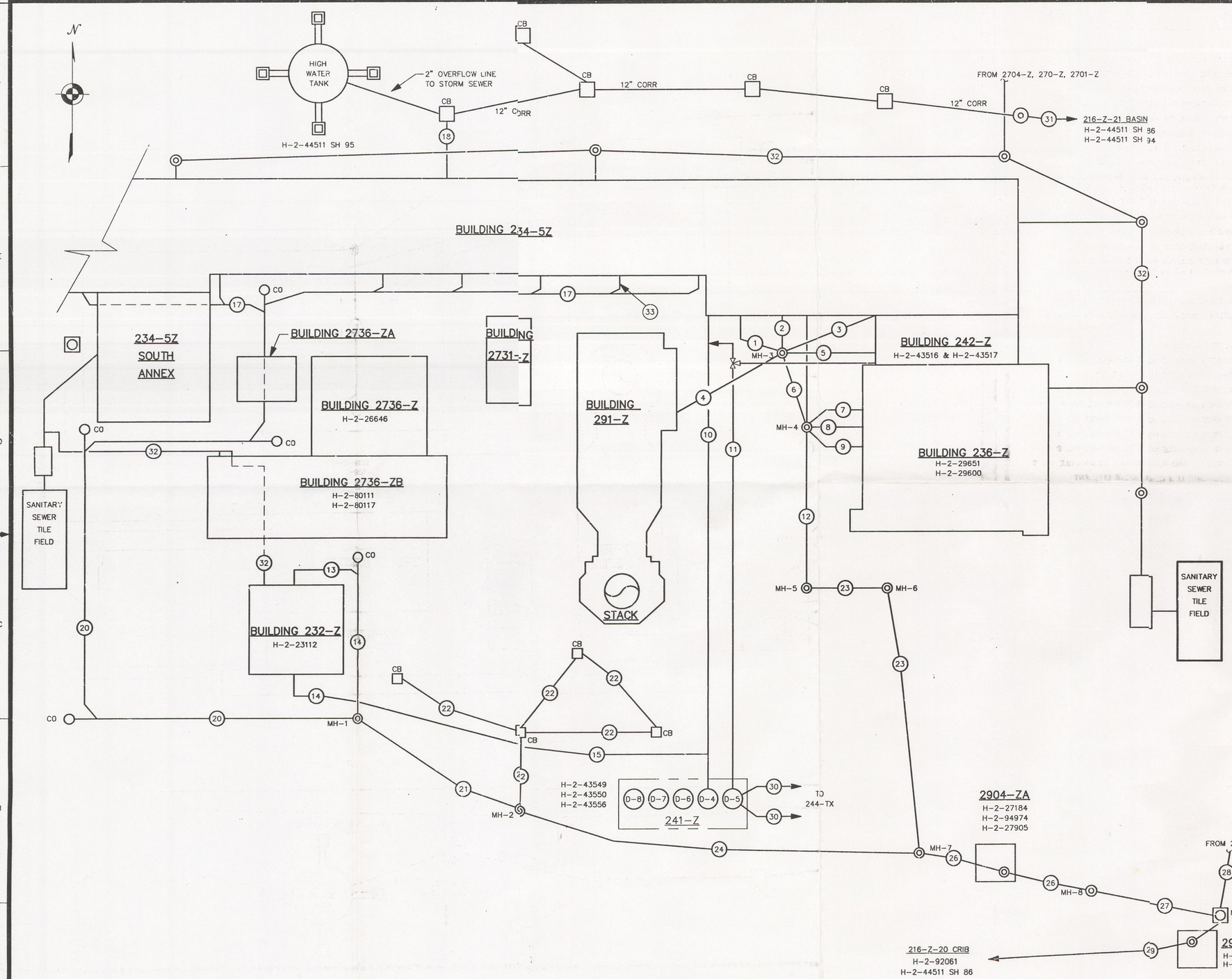
Rockwell Hanford Operations
Richland, Washington 99352

WASTE EFFLUENT DRAIN SCHEMATIC PLAN

SCALE	BLDG NO.	INDEX NO.
NONE	200-Z,216-Z	7000

DRAWING NO.	SHEET	OF	REV
H-2-97310	1	1	1

JUL 29 1992
NOT CURRENT STATUS OF CONSTANDING
ECNS FROM DATA BASE



STREAM DESCRIPTION

STREAM NUMBER	
1	234-5Z DRAIN HEADER D-1 TO MANHOLE NO. 3
2	234-5Z DRAIN HEADER D-2 TO MANHOLE NO. 3
3	234-5Z BUILDING ROOF DRAIN TO MANHOLE NO 3
4	291-Z SUMP PUMP DISCHARGE TO MANHOLE NO. 3
5	242-Z DRAIN HEADER D-1 TO MANHOLE NO. 3
6	MANHOLE NO. 3 DRAIN TO MANHOLE NO. 4
7	236-Z CONDENSATE HEADER DRAIN TO MANHOLE NO. 4
8	236-Z DRAIN HEADER D-1 TO MANHOLE NO. 4
9	236-Z DRAIN HEADER D-3 TO MAHOLE NO. 4
10	234-5Z DRAIN HEADERS D-4, D-5, D-6,242-Z DRAIN HEADERS D-4 & D-6 TO 241-Z TANK NO. D-4, D-7 AND D-8
11	242-Z DRAIN HEADER D-5 TO 241-Z TANK NO. D-5
12	MANHOLE NO. 4 DRAIN TO MANHOLE NO. 5
13	232-Z CONDENSATE DRAIN TO MANHOLE NO. 1
14	232-Z CONDENSATE DRAIN TO MANHOLE NO. 1
15	232-Z SCRUBBER COOLING WATER DISCHARGE AND FLOOR DRAIN TO 241-Z TO TANK D-4
17	234-5Z BUILDING ROOF DRAIN TO MANHOLE NO. 1
18	234-5Z STEAM CONDENSATE DRAIN TO 216-Z-21 BASIN
20	DRAIN LINE TO MANHOLE NO. 1
21	DRAIN LINE FORM MANHOLE NO. 1 TO MANHOLE NO. 2
22	STORM SEWER DRAIN LINES TO MANHOLE NO. 2
23	DRAIN LINE FROM MANHOLE NO. 5 TO MANHOLE NO. 6
24	DRAIN LINE FROM MANHOLE NO. 2 TO MANHOL NO. 7
25	DRAIN LINE FROM MANHOLE NO. 6 TO MANHOLE NO. 7
26	DRAIN LINE FROM MANHOLE NO. 7 TO MANHOLE NO. 8
27	DRAIN LINE FROM MANHOLE NO. 8 TO MANHOLE NO. 9
28	231-Z CONDENSATE AND FLOOR DRAINS TO MANHOLE NO. 9
29	Z-PLANT COMPOSITE LOW LEVEL WASTE EFFLUENT STREAMS DRAIN TO 216-Z-20 TILE FIELD
30	HIGH LEVEL SALT WASTE TO TANK FARM
31	STORM SEWER TO 216-Z-21 BASIN
32	SANITARY SEWER
33	ROOM 336-337, FROM 234-5Z CHEMICAL PREPARATION CHEMICAL WASTE SEWER DRAIN

DRAIN HEADER CONTENTS DESCRIPTION

D-1	COLD CHEMICAL AND NONCONTAMINATED PROCESS WASTE DRAIN
D-2	COLD PROCESS COOLING WATER AND CONDENSATE DRAIN
D-3	PROCESS COOLING WASTE DRAIN (POTENTIALLY CONTAMINATED)
D-4	LOW SALT WASTE DRAIN
D-5	LOW SALT WASTE DRAIN 234-5Z
D-5	HIGH SALT WASTE DRAIN 236-Z
D-6	LOW SALT WASTE DRAIN

LEGEND

CB	CATCH BASIN
MH	MANHOLE
CO	CLEAN OUT

WHC-SD-CP-PLN-010 REV. 1

APPENDIX B
PAGE 37

DRAWING TRACEABILTY LIST		REFERENCE DRAWINGS	
DWG. NO.	TITLE	DWG. NO.	TITLE
H-2-29645	PLOT PLAN MECH 236-Z		
H-2-23872	PLOT PLAN OUTSIDE LINES		

REVISION APPROVALS						
MICRO FYI'D	COG ENGINEER	DESIGN MANAGER	QUALITY ASSURANCE	DESIGN ENGINEER	DRAFTING	CHKD BY DATE / REV BY DATE
						MLG 1-13-92

REVISIONS		
NEXT USED ON	DESCRIPTION	REV. NO.
	170656 REVISED PER ECN #	1

DRAWING STATUS

DRAWING APPROVALS	DATE
APPD FOR QUALITY ASSURANCE	
APPD	
DESIGN MANAGER	
APPD	
DESIGN ENGINEER HH IRBY	
DRAFTING APPD	
CHECKED	
DRAWN P.L. MOORE	
CADFILE B097310A	
CAD CODE 1C:IBM:ACD2:11:SN	

U. S. Department of Energy
Richland Operations Office
Rockwell Hanford Operations
Richland, Washington 99352

WASTE EFFLUENT DRAIN SCHEMATIC PLAN

SCALE	BLDG NO.	INDEX NO.
NONE	200-Z,216-Z	7000

DRAWING NO.	SHEET	OF	REV
H-2-97310	1	1	1

JUL 29 1992
CAUTION
NOT COMPLETE WITHOUT
CURRENT STATUS OF OUTSTANDING
ECNS FROM DATA BASE