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A STUDY OF ARHCO RADIOACTIVE GASEOUS AND LIQUID EFFLUENT
RELEASE POINTS TO THE ENVIRONS FROM 200 AREA FACILITIES

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By

L. L. Lundgren

Personnel Protection Section
Industrial Relations & Administration Department
Business Management Division

April 1, 1969

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A STUDY OF ARHCO RADIOACTIVE GASEOUS AND LIQUID EFFLUENT
RELEASE POINTS TO THE ENVIRONS FROM 200 AREA FACILITIES

INTRODUCTION

The purpose of this study is to review the current status of gaseous and liquid effluents that have a potential for release of radioactivity to the environs from ARHCO operations in the 200 Areas. Non-radioactive pollutants to the environs are not included in this study. The study provides a complete compilation of the active effluent streams released to the environs including associated monitoring and sampling equipment and analytical procedures. Recommendations are made for improved monitoring and sampling of the active effluent systems which, in the opinion of the Personnel Protection Section, are now inadequate.

DISCUSSION

1. Nomenclature

The Facilities Engineering Department is responsible for establishing the nomenclature for all 200 Area gaseous and liquid effluent systems.

The system of nomenclature used for radioactive gaseous effluent release points from the 200-foot main stacks is 291- followed by the plant area designation and site number. Other radioactive gaseous effluent release points, including vents, are assigned a 296 prefix followed by the plant designation and site number.

All liquid effluent disposal sites (cribs, swamps, dry wells, and French drains) are assigned a 216 prefix followed by the plant designation and site number.

2. Other Effluent Systems

The gaseous effluent release points from Hanford contractor facilities in the 200 Areas other than ARHCO are not included in this study. They are Pacific Northwest Laboratory (PNL) in the 242-B, 209-E, 221-T, 229-T, 222-U, 292-U, and 231-Z Buildings, and ITT/FSS in the 2724-W Building. The responsibility for release to the environs from these facilities lies with the contractor concerned. The emission data for the effluent release points is submitted to ARHCO on a routine basis.

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The study does review all active liquid effluents from ARHCO facilities, Pacific Northwest Laboratory operations in the 209-E, 221-T, 222-U, and 231-Z Buildings, and the ITT/FSS operation in the 2724-W Building.

3. Definition of Terms

The following definitions are given to clarify the use of terms in this study.

- A. Non-routine request: The flow rate of an effluent will be checked upon request but is not done routinely.
- B. Liquid waste: Radioactive or potentially radioactive liquid effluents released to the environs are designated "liquid wastes".
- C. Waste water: Non-radioactive liquid effluent normally discharged to the environs from the cold areas of a facility.

4. Analytical Procedures

The analytical support for ARHCO operations in the 200 Areas is provided by Purex, Redox, and Plutonium Finishing Analytical Laboratories of the Technical Services Section. Additional service is provided by the Pacific Northwest Laboratory on a contract basis.

The analytical procedures for routine samples of gaseous and liquid effluents at release points are standardized but do vary with the particular analytical requirements of each laboratory. The Separations Chemistry Laboratory has the responsibility for evaluating and approving these procedures.

The cross checking of analytical procedures between the laboratories cannot always be easily accomplished since the matrix of the samples and their analytical requirements vary to a considerable degree in each laboratory. Laboratory space would have to be provided specifically for this type of program.

The handling of low level environmental samples, particularly from open ponds and ditches, is a continuing problem for the laboratories. Working with process samples of high radioactivity in a laboratory can result in enough residual contamination and high background radiation to adversely affect the analytical results for this type of very low level sample.

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5. Release Guides

The release guides for the gaseous and liquid effluent systems in this study were established in accordance with the intent of AEC Manual Chapter 0510, RL Supplement.

SUMMARY

This study intends to provide a complete and comprehensive source of reliable reference information for those in ARHCO having either an interest in or a responsibility for gaseous and liquid effluents released to the environs in or near the 200 Areas.

The content has been reviewed by and comments received from the analytical laboratories and operations sections. Most of the comments were incorporated. A somewhat arbitrary approach has necessarily been taken on the problem of format so that the study could be issued on a reasonable time schedule. Updating and revision will be done as appropriate.

ACKNOWLEDGEMENTS

The author gratefully acknowledges the contributions of W. R. Gority, L. P. McRae, and W. H. Sant to the analytical section of this report, and the special assistance received from D. J. Brown in providing background information on the effluent streams.

The author also wishes to express his appreciation for the cooperation and assistance of many other persons reviewing the document and making suggestions for its improvement.

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STUDY A

THE GASEOUS RADIOACTIVE EFFLUENT
RELEASE POINTS TO THE ENVIRONS

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GASEOUS EFFLUENT STUDY

PUREX SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
291-A 1	The discharge of filtered ventilation air and process vent off-gas into the 200-foot stack south of the 202-A Building.	123	Continuous effluent flow measurement. Triweekly primary and secondary samples of the effluent. Analytical laboratory counting procedures for alpha-beta and ¹³¹ I measurement of the effluent sample. In-line monitoring and alarm systems for beta-gamma detection in the effluent.	Same as surveillance being provided.	The overall effluent system is satisfactory. The BSS monitoring system requires calibration. The BSS system requires a procedure for setting the alarm. The BSS system requires a procedure for appropriate action in response to an alarm.

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GASEOUS EFFLUENT STUDY

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-A 1	The discharge of filtered air from the N and Q Cell, and the PR Room into the stack on the northwest side of the 202-A Building.	127	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample.	Same as surveillance being provided with the addition of continuous in-line monitoring and alarm system.	The effluent is a high level Pu source, therefore, filter failure could cause a significant release of contamination. Should a failure occur, portions of the filter inventory could be released.

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GASEOUS EFFLUENT STUDY

PUREX SECTION

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296-A 2	The discharge of filtered hood exhaust air from the west sample gallery into the stack at the southwest corner of the 202-A Building.	129	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample.	Same as surveillance being provided with the addition of continuous in-line monitoring and alarm system.	Highly radioactive atomized process solution could be released from the effluent in the event of filter failure. Should a failure occur, portions of the filter inventory could be released.

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GASEOUS EFFLUENT STUDY

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-A 3	The discharge of filtered hood exhaust air from the east sample gallery into the stack on the northeast side of the 202-A Building.	131	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample.	Same as surveillance being provided with the addition of continuous in-line monitoring and alarm system.	Highly radioactive atomized process solution could be released from the effluent in the event of filter failure. Should a failure occur, portions of the filter inventory could be released.

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GASEOUS EFFLUENT STUDY

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-A 5	The discharge of filtered air from the analytical laboratory hoods and glove boxes into the stack on the roof of the 202-A Laboratory Annex.	133	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample.	Same as surveillance being provided.	The effluent sampling is adequate.

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GASEOUS EFFLUENT STUDY

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296-A 6	The discharge of unfiltered air from the east sample gallery and U Cell into the stack on the northeast side of the 202-A Building.	135	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample.	Same as surveillance being provided.	The effluent sampling is adequate. Air monitoring with an alarm is provided in the sample gallery.

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GASEOUS EFFLUENT STUDY

PUREX SECTION

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296-A 7	The discharge of unfiltered air from the west sample gallery and R Cell into the stack at the southwest corner of the 202-A Building.	137	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample.	Same as surveillance being provided.	The effluent sampling is adequate. Air monitoring with an alarm is provided in the sample gallery.

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GASEOUS EFFLUENT STUDY

PUREX SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-A 8	The discharge of unfiltered air from the west end of the P&O Gallery (White Room) into the stack at the northwest corner of the 202-A Building.	139	Triweekly samples of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample.	Same as surveillance being provided.	The effluent sampling is adequate. Air monitoring with an alarm is provided in the P&O Gallery.

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296-A 10	The discharge of filtered air from disposal tunnel into the stack at the south end of the 202-A Building Equipment Disposal Tunnel #2.	141	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample.	Same as surveillance being provided.	The effluent sampling is adequate.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-A 14	The discharge of filtered building air into the stack on the roof of the 293-A Back-Up Facility.	143	Weekly filter sample of the effluent. Filter counting procedures for alpha-beta measurement of the effluent sample.	Same as surveillance being provided.	The overall effluent system is satisfactory.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-A 15 Vent	The discharge of the filtered air from UNH Storage Tanks into the vent on the roof of the 203-A Building.	145	None	The vent system requires non-routine sampling.	Sampling capability should be provided for the system.
296-A 16 Vent	The discharge of unfiltered air from the 216-A 2 Tank into the vent above ground southwest of the 291-A Building.	145			

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-U 2	The discharge of filtered ventilation air from the depleted UO_3 Calciner Facility into the stack on the roof of the 224-UA Building.	147	Daily filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided.	The effluent sampling is adequate.

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GASEOUS EFFLUENT STUDY

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-U 3	The discharge of filtered ventilation air from the enriched UO ₃ Calciner Facility into the stack on the roof of the 224-U Building.	149	Daily filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided.	The effluent sampling is adequate.

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GASEOUS EFFLUENT STUDYPUREX SECTION

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296-U 4	The discharge of unfiltered air from the acid absorber and UNH concentrator into the stack on the roof of the 224-U Building.	151	None	The effluent system requires sampling capability.	Non-routine sampling capability should be provided for the system.

GASEOUS EFFLUENT STUDY

PUREX SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-U 5	The discharge of filtered air from the Thorium pot in F Cell into the stack on the roof of the 224-U Building.	153	Daily filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required.(16)	Same as surveillance being provided.	The effluent sampling is adequate.

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GASEOUS EFFLUENT STUDYWASTE MANAGEMENT SECTION

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296-A 11*	The discharge of filtered noncondensable vapors from storage tanks into the stack on the roof of the 431 Condenser Building in the 241-A Tank Farm.	155	None	The effluent system requires continuous sampling with in-line monitoring and alarm system.	<p>When installed, the monitoring system will require calibration.</p> <p>The system will require a procedure for setting the alarm.</p> <p>The system will require a procedure for appropriate action in response to an alarm.</p> <p>An engineering effort is needed so that sampling can be accomplished.</p>

- * Inactive (standby) as of March 18, 1969.
Replaced by the 296-A 17 Stack.

GASEOUS EFFLUENT STUDYWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-A 12	The discharge of filtered off-gas from process vessels into the stack on the north side of the 244-AR Vault.	157	Daily samples of the effluent. Analytical Laboratory counting procedures for beta and ¹³¹ I measurement of the effluent sample. In-line monitoring and alarm system for beta-gamma detection in the effluent.	Same as surveillance being provided.	The overall effluent system is satisfactory.

GASEOUS EFFLUENT STUDY

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-A 13	The discharge of filtered ventilation air from the vault into the stack on the north side of the 244-AR Vault.	161	Daily samples of the effluent. Analytical laboratory counting procedures for beta and ¹³¹ I measurement of the effluent sample. In-line monitoring and alarm system for beta-gamma detection in the effluent.	Same as surveillance being provided.	The overall effluent system is satisfactory.

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GASEOUS EFFLUENT STUDY
WASTE MANAGEMENT SECTION

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296-A 17*	The discharge of filtered noncondensable vapors from storage tanks into the stack on the east side of the 702 Condenser Building in the 241-A Tank Farm.	165	Daily filter sample of the effluent. Filter counting procedure for beta measurement of the effluent sample. In-line monitoring and alarm system for beta-gamma detection in the effluent.	Same as surveillance being provided.	The monitoring system requires calibration. The system requires a procedure for setting the alarm. The system requires a procedure for appropriate action in response to an alarm.

* Replaces the 296-A 11 Stack.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
291-B 1	The discharge of filtered ventilation air and process vent off-gas into the 200-foot stack south of the 221-B Building.	169	Daily filter sample of the effluent. Filter counting procedure for beta measurement of the effluent sample. In-line monitoring and alarm system for beta-gamma detection in the effluent.	Same as surveillance being provided.	The monitoring system requires calibration. The system requires a procedure for setting the alarm. The system requires a procedure for appropriate action in response to an alarm.

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GASEOUS EFFLUENT STUDY

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296-B 2	The discharge of filtered noncondensable vapors from the ITS Unit #1 into the stack on the east side of the 241-BY Tank Farm.	173	Daily filter sample of the effluent. Filter counting procedure for beta measurement of the effluent sample. In-line monitoring and alarm system for beta-gamma detection in the effluent.	Same as surveillance being provided.	The monitoring system requires calibration. The system requires a procedure for setting the alarm. The system requires a procedure for appropriate action in response to an alarm.

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296-B 3	The discharge of filtered noncondensable vapors from the ITS Unit #2 into the stack on the west side of the 241-BY Tank Farm.	177	Daily filter sample of the effluent. Filter counting procedure for beta measurement of the effluent sample. In-line monitoring and alarm system for beta-gamma detection in the effluent.	Same as surveillance being provided.	The monitoring system requires calibration. The system requires a procedure for setting the alarm. The system requires a procedure for appropriate action in response to an alarm.

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296-B 5	The discharge of filtered building air into the stack at the northeast corner of the 221-BB Building.	181	None	The effluent system requires non-routine sampling.	Sampling capability should be provided for the system.

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296-B 6	The discharge of filtered ventilation air from storage tanks into the stack at the southwest corner of the 241-BY Tank Farm.	183	Daily filter sample of the effluent. Filter counting procedure for beta measurement of the effluent sample.	Same as surveillance being provided.	The effluent sampling is adequate.

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GASEOUS EFFLUENT STUDYWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
291-C 1	The discharge of filtered ventilation air and process vent off-gas into the 200-foot stack west of the 291-C Building.	185	Daily filter sample of the effluent. Filter counting procedure for beta measurement of the effluent sample. In-line monitoring and alarm system for beta-gamma detection in the effluent.	Same as surveillance being provided.	If the normal building operation is resumed, calibration of the monitoring system and alarm procedures will be required.

GASEOUS EFFLUENT STUDY
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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-C 2	The discharge of filtered air from the A and C Sample Galleries into the stack on the roof of the annex connecting the 281-C and 201-C Buildings.	189	Weekly filter sample of the effluent. Filter counting procedure for beta measurement of the effluent sample.	Same as surveillance being provided with the addition of continuous in-line monitoring and alarm system.	The monitoring system will require calibration and alarm procedures after installation, if the normal building operation is resumed.

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GASEOUS EFFLUENT STUDYWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-C 5	The discharge of filtered ventilation air from storage tanks and the vault into the stack east of the CR Vault in the 241-C Tank Farm.	191	Daily filter sample of the effluent. Filter counting procedure for beta measurement of the effluent sample.	Same as surveillance being provided.	The effluent sampling is adequate.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
291-S 1	The discharge of filtered ventilation air and process vent off-gas into the 200-foot stack east of the 202-S Building.	193	Daily filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16) In-line monitoring and alarm system for beta-gamma detection in the effluent.	Same as surveillance being provided.	If the normal building operation is resumed, calibration of the monitoring system and alarm procedures will be required.

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GASEOUS EFFLUENT STUDY
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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-S 1	The discharge of filtered air from the south sample gallery and sampler hoods into the stack at the southeast corner of the 202-S Building.	197	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided with addition of continuous in-line monitoring and alarm system.	The monitoring system will require calibration and alarm procedures after installation, if the normal building operation is resumed.

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GASEOUS EFFLUENT STUDY
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296-S 2	The discharge of filtered air from the north sample gallery and sampler hoods into the stack at the northeast corner of the 202-S Building.	199	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided with the addition of continuous in-line monitoring and alarm system.	The monitoring system will require calibration and alarm procedures after installation, if the normal building operation is resumed.

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GASEOUS EFFLUENT STUDY

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-S 4	The discharge of filtered air from rooms, shops, and SWP Lobby into the stack at the east end of the 202-S Building.	201	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided.	The effluent sampling is adequate.

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GASEOUS EFFLUENT STUDY

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-S 5	The discharge of filtered air from the product removal cage into the stack on the roof of the 202-S Silo.	203	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided.	The effluent sampling is adequate.

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GASEOUS EFFLUENT STUDY

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-S 6	The discharge of unfiltered air from the silo gallery, organic feed tank, and the sample elevator into the stack at the west end of the 202-S Building.	205	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided.	The effluent sampling is adequate.

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GASEOUS EFFLUENT STUDY
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296-S 7	The discharge of filtered ventilation air from the loadout facility into the stack at the north end of the 233-S Loadout Facility.	207	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided with the addition of continuous in-line monitoring and alarm system.	The monitoring system will require calibration and alarm procedures after installation, if the normal building operation is resumed.

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GASEOUS EFFLUENT STUDYWASTE MANAGEMENT SECTION

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296-S 14	The discharge of filtered noncondensable vapors from storage tanks into the stack at the 401 Building in the 241-SX Tank Farm.	209	None	The effluent system requires sampling capability.	An engineering effort is needed so that sampling can be accomplished.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-S 15	The discharge of filtered ventilation air from storage tanks into the stack in the center of the 241-SX Tank Farm.	211	Daily filter sample of the effluent. Filter counting procedures for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided.	Assured sampling of the effluent system is needed.

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GASEOUS EFFLUENT STUDY
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-T 1	The discharge of unfiltered air from the hot cell into the stack on the south side of the 242-T Waste Evaporator Facility.	213	Daily filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided.	The effluent sampling is adequate.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-T 2	The discharge of unfiltered air from the waste catch tank cell into the stack on the northeast corner of the 242-T Waste Evaporator Facility.	215	Daily filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided.	The effluent sampling is adequate.

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GASEOUS EFFLUENT STUDYWASTE MANAGEMENT SECTION

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296-T 4	The discharge of filtered ventilation air from storage tanks into the stack at the north end of the 241-TX Tank Farm.	217	Daily filter sample of the effluent. Filter counting procedures for alpha-beta measurement of the effluent sample. Gamma energy analysis of effluent sample as required. (16)	Same as surveillance being provided.	The effluent sampling is adequate.

GASEOUS EFFLUENT STUDY

TECHNICAL SERVICES SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-S 13	The discharge of filtered air from hoods, glove boxes, hot cells, and ventilation air into the stack on the roof of the 222-S Building.	219	Daily filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. In-line monitoring and alarm systems for alpha and beta-gamma detection in the effluent.	Same as surveillance being provided.	The effluent sampling is adequate.

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GASEOUS EFFLUENT STUDY
TECHNICAL SERVICES SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-S 16	The discharge of filtered exhaust air from waste tank and vault into the stack at the northwest corner of the 219-S Vault.	223	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided.	The effluent sampling is adequate.

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GASEOUS EFFLUENT STUDY

CPD SERVICES SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
291-T 1	The discharge of filtered and unfiltered ventilation air into the 200-foot stack southeast of the 221-T Building.	225	Daily filter sample of the effluent. Weekly filter samples of the canyon air. Filter counting procedure for alpha-beta measurement of the effluent samples. Gamma energy analysis of the effluent samples as required. (16) In-line monitoring and alarm systems for beta-gamma detection in the canyon air samples.	Same as surveillance being provided.	The effluent sampling is adequate.

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GASEOUS EFFLUENT STUDYCPD SERVICES SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-T 7*	The discharge of unfiltered air from railway and automotive pits into the stack on the west side of the 2706-W Decontamination Facility.	229	Daily filter samples of the building air. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided.	The effluent sampling is adequate.

- Activated only during use of solvents for decontamination operations.

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CPD SERVICES SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
291-U 1*	The discharge of filtered ventilation air from the 221-U Canyon and the hot side of the 241-WR Vault into the 200-foot stack southeast of the 221-U Building.	231	Weekly filter samples of the canyon air. Filter counting procedures for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent samples as required. (16) In-line monitoring and alarm systems for beta-gamma detection in the canyon air samples.	Same as surveillance being provided.	The effluent sampling is adequate.

* Activated only when the canyon conditions over a seven-day period indicate assault mask status.

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CPD SERVICES SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-U 6*	The discharge of unfiltered ventilation air from the cold side of the vault into the stack in the 241-WR Exclusion Area.	233	Weekly filter sample of the effluent. Filter counting procedure for alpha-beta measurement of the effluent sample. Gamma energy analysis of the effluent sample as required. (16)	Same as surveillance being provided.	The effluent sampling is adequate.

* Activated only during Thorium storage.

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GASEOUS EFFLUENT STUDY
PLUTONIUM FINISHING SECTION

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291-Z 1	The discharge of filtered ventilation air and process vent off-gas into the 200-foot stack south of the 234-5 Building.	235	Daily proportional filter sample of the effluent. Filter counting procedure for plutonium measurement of the effluent sample. Alpha in-line monitoring and alarm system.	Same as surveillance being provided.	The sampler alarm should be located in an occupied area. The in-line monitoring system requires calibration. The system requires a procedure for setting the alarm. The system requires a procedure for appropriate action in response to an alarm. An engineering effort may be needed to reach the desired alarm sensitivity.

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GASEOUS EFFLUENT STUDY

PLUTONIUM FINISHING SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
296-Z 3	The discharge of filtered air from cells and vent off-gas from tanks into the stack at the west end of the 241-Z Sump Area.	239	Weekly proportional sample of the effluent. Filter counting procedure for plutonium measurement of the effluent sample.	Same as surveillance being provided.	The effluent sampling is adequate.

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STUDY B

THE LIQUID RADIOACTIVE EFFLUENT
RELEASE POINTS TO THE ENVIRONS

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LIQUID EFFLUENT STUDY

PUREX SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-A 6 Crib	Receives steam condensate from the 202-A Building.	255	Estimated effluent discharge. Weekly proportional sample of the effluent. Two-month composite of the effluent. Analysis of samples for selected constituents in the effluent.	Same as surveillance being provided with the addition of continuous in-line monitoring and alarm system.	The effluent is a potential source of gross fission product release to the environs. The monitoring system requires a detection level of 1×10^{-4} $\mu\text{Ci/ml}$ mixed fission products.

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LIQUID EFFLUENT STUDYPUREX SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-A 10 Crib	Receives process condensate from the 202-A Building.	256	Estimated effluent discharge. Weekly dip sample of the effluent. Two-month composite of the effluent. Analysis of samples for selected constituents in the effluent.	Same as surveillance being provided with proportional sampling instead of dip sampling of the effluent. Continuous in-line monitoring and alarm system is required.	The knowledge of the inventory sent to the crib is inadequately measured. The monitoring system requires a detection level of 1×10^{-4} $\mu\text{Ci/ml}$ mixed fission products.

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PUREX SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-A 11 French Drain	Receives liquid waste from Trap Pit #1 at the 202-A Building.	257	None	See comments.	An effort should be made to look for opportunities to eliminate French Drains so that surveillance would not be necessary.
216-A 12 French Drain	Receives liquid waste from Trap Pit #3 at the 202-A Building.	257			
216-A 15 French Drain	Receives process condensate overflow from the A5 Catch Tank sampler located east of the 216-A 5 Sampler Pit.	258			
216-A 16 French Drain	Receives floor drain waste from the 431 Building in the 241-A Tank Farm, and condensate from the 296-A 11 Stack (see Page 29).	258			
216-A 17 French Drain	Receives the overflow from the 216-A 16 French Drain.	259			

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-A 22 French Drain	Receives sump waste from the UNH truck loading apron in the 203-A Storage Area.	259	None	See comments.	An effort should be made to look for opportunities to eliminate French Drains so that surveillance would not be necessary.
216-A 23 A&B French Drain	Receives de-entrainment and back flush waste from the 431 Building in the 241-A Tank Farm.	260			

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216-A 27 Crib	Receives liquid waste from the 202-A Analytical Lab and liquid waste from the 291-A Area.	261	Measured batch discharge to the effluent. Waste Tank sample of every batch to the effluent. Weekly dip sample from the riser to the crib. Two-month composite for selected constituents in the effluent.	Same as surveillance being provided.	The effluent sampling is adequate.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-A 30 Crib	Receives steam condensate from the 202-A Building, and miscellaneous waste from the 202-A Equipment Disposal Tunnel.	262	Estimated effluent discharge. Weekly proportion sample of the effluent. Two-month composite of the effluent. Analysis of samples for selected constituents in the effluent.	Same as surveillance being provided with the addition of continuous in-line monitoring and alarm system.	The effluent is a potential source of large fission product release to the environs.

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216-A 31 Crib	Receives occasional process organic waste from the 202-A Building.	263	As required.	See comments.	If the crib is used, appropriate batch sampling would be adequate.

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216-A 36B Crib	Receives ammonia scrubber waste from the 202-A Building.	264	Measured batch discharge to the effluent. Daily proportional sample of the effluent. Two-month composite of the effluent. Analysis of samples for selected constituents in the effluent.	Same as surveillance being provided with the addition of in-line gamma monitoring and alarm system.	The location and method of sampling is poor. The effluent is a potential source of large inventory release to the environs.

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PUREX SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-U 12 Crib	Receives process condensate from the 224-U Building.	265	Measured batch discharge to the effluent. Weekly proportional sample of the effluent. Monthly composite of the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

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216-A 8 Crib	Receives condensate from waste storage tanks in the 241-A and AX Tank Farms.	267	Daily effluent flow measurement. Tank sample of the effluent every shift. Monthly composite of the effluent. Analysis of samples for selected constituents in the effluent.	Same as surveillance being provided with proportional sampling instead of dip sampling of the effluent.	The knowledge of the inventory sent to the crib is questionable.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-A 24 Crib	Serves as a back up to the 216-A 8 Crib.	268	As required.	See comments.	If the sampling of the effluent to A-8 Crib is satisfactory, then no additional surveillance is needed.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-A 25 Swamp	Receives cooling water from the 202-A Building, condenser cooling water from the 431 Building in the 241-A Tank Farm, cooling water and steam condensate from the 244-AR Vault, and waste water from the 284-E Powerhouse.	269	Continuous total effluent flow measurement to swamp. Weekly proportional sample of the 202-A effluent. Weekly dip sample of the A and AX Tank Farm effluent. Weekly dip sample of the influent into swamp. Weekly dip sample from north end of the swamp. Two-month composite of the 202-A effluent. Monthly composite of the A and AX Tank Farm effluent. Analysis of samples for selected constituents in the effluent. In-line monitoring and alarm system for gamma detection in the AR Vault effluent.	Same as surveillance being provided with proportional sampling of the 202-A, 241-A&AX, and 244-AR effluents, and the A-25 Swamp influent instead of dip sampling. Minimum in-line gamma monitoring and recorder should be required for all major contributing effluent streams. In-line monitoring and recorder with alarm should be provided for the A-25 Swamp influent.	Diversion possibilities should be further explored for the effluent to A-25 Swamp. Wherever possible, contributing effluent streams with a high potential for fission product release should be eliminated from the system. Leaks could develop in high inventory streams. The monitoring system requires a detection level of 1×10^{-5} $\mu\text{Ci/ml}$ mixed fission products.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-A 26 French Drain	Receives floor drain waste from the 291-A Fan Control House.	273	None	See comments.	The effluent has no potential for significant discharge to the environs.

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LIQUID EFFLUENT STUDY
WASTE MANAGEMENT SECTION

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216-A 29 Ditch	Receives chemical sewer waste from the 202-A Building.	274	Estimated effluent discharge. Weekly proportional sample of the effluent. Two-month composite of the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	It is a poor philosophy to discharge contaminated waste to open ponds.

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LIQUID EFFLUENT STUDYWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-A 39 Ditch	Receives diverted cooling water and steam condensate from the 244-AR Vault (see Page 75).	275	As required.	See comments.	If the monitoring system for the diversion of the effluent from A-25 Swamp is satisfactory, then the surveillance is adequate.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-A 40 Crib	Receives floor drain waste from the 706-B Building in the 241-AX Tank Farm.	276	None	See comments.	<p>The potential is small for release of fission products to the environs, however, this type of system is generally of poor design.</p> <p>An effort should be made to look for opportunities to eliminate systems where no surveillance is maintained.</p>

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-B 2 Ditch	Receives cooling water, occasional steam condensate, and chemical sewer waste from the 221-B Building, cooling water from the ITS # 1 and 2 facilities and the CR Vault, and chemical sewer waste from the 216-A 29 Ditch.	277	Continuous effluent flow measurement from the ITS facilities. Estimated effluent discharge from the 221-B and CR Vault. Weekly dip sample of the CR Vault effluent. Dip sample of every 221-B effluent batch to the ditch from the retention basin. Weekly dip sample of the chemical sewer effluent. Weekly dip sample from the ditch. Monthly composite of the 221-B and CR Vault effluents. Analysis of samples for selected constituents in the effluents. In-line monitoring and alarm systems for gamma detection in the 221-B and CR Vault effluents.	Same as surveillance being provided with proportional sampling instead of dip sampling of the effluent at the inlet to the 24-inch underground pipe. Sampling capability is required of the effluents from the ITS # 1 and 2 facilities. In-line beta monitoring would be highly desirable for the 221-B effluent.	A considerable engineering effort is needed so that beta monitoring for the 221-B effluent can be accomplished. The monitoring system for the 221-B effluent requires a detection at least down to a level of 1×10^{-5} $\mu\text{Ci/ml}$ ^{90}Sr . The B and C Farm Water and CCR monitoring systems require calibration.

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LIQUID EFFLUENT STUDY
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-B 3 Swamp	Receives waste from the 216-A 29 and 216-B 2 Ditches.	281	Estimated discharge to the swamp from A-29 and B-2 Ditches. Weekly dip sample of the influent to the swamp from B-2 Ditch. Weekly dip sample from north end of the swamp. Analysis of samples for selected constituents in the effluent.	See comments.	If the sampling and monitoring of the A-29 and B-2 influents are satisfactory, then no additional surveillance is needed.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-B 12 Crib	Receives process condensate from the 221-B Building.	283	Estimated effluent discharge. Tank dip sample of the effluent every shift. Weekly and monthly composite of the effluent. Analysis of samples for selected constituents in the effluent. In-line monitoring and alarm system for beta-gamma detection in the effluent.	Same as surveillance being provided.	The sensitivity of the monitoring system is not as good as desired.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-B 13 French Drain	Receives liquid waste from the 291-B 1 Stack drain.	285	None	See comments.	An effort should be made to look for opportunities to eliminate French Drains so that surveillance would not be necessary.

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LIQUID EFFLUENT STUDY
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-B 50 Crib	Receives waste storage tank condensate from ITS #1 operations in the 241-BY Tank Farm.	286	Estimated effluent discharge. Continuous daily sampling of the effluent. Weekly and monthly composite of the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

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LIQUID EFFLUENT STUDY
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-B 55 Crib	Receives steam condensate from the concentrators in the 221-B Building.	287	Estimated effluent discharge. Tank dip sample of the effluent every shift. Weekly and monthly composites of the effluent. Analysis of samples for selected constituents in the effluent. In-line monitoring and alarm system for beta-gamma detection in the effluent.	Same as surveillance being provided.	The sensitivity of the monitoring system is not as good as desired.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-B 57 Crib	Receives waste storage tank condensate from ITS #2 operations in the 241-EY Tank Farm.	289	Estimated effluent discharge. Continuous daily sampling of the effluent. Weekly and monthly composite of the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

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LIQUID EFFLUENT STUDY
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-B 58 Ditch	Receives diverted cooling water and steam condensate from the 221-B Building (see Page 80).	290	As required.	See comments.	If the monitoring system for the diversion of the effluent (15-inch header) from the B-2 Ditch is satisfactory, then no additional surveillance is needed.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-B 61 Crib	Serves as a back up to the 216-B 50 Crib.	291	As required.	See comments.	If the sampling of the effluent to B-50 Crib is satisfactory, then the surveillance is adequate.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-C 2 Dry Well	Receives liquid waste from the 291-C 1 Stack drain.	292	None	See comments.	An effort should be made to look for opportunities to eliminate this type of system so that surveillance would not be necessary.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-C 7 Crib	Receives liquid waste from BNW operations in the 209-E Building.	293	Measured batch discharge to the effluent. Waste tank sample of every batch to the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory, if every batch of waste is sampled properly.

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AIM

Association for Information and Image Management

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Silver Spring, Maryland 20910
301/587-8202

Centimeter

Inches

MANUFACTURED TO AIM STANDARDS
BY APPLIED IMAGE, INC.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-C 8 French Drain	Receives floor drain waste from 271-CR Building.	294	None	See comments.	An effort should be made to look for opportunities to eliminate French Drains so that surveillance would not be necessary.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-C 9 Swamp	Receives cooling water and steam condensate and floor drain waste from the 201-C Building and waste water from BNW operations in the 209-E Building.	295	Estimated discharge to the swamp. Weekly dip sample of the influent line to the swamp from 201-C. Weekly dip sample from south side of the swamp. Monthly composite of the 201-C effluent. Analysis of samples for selected constituents in the effluent. In-line monitoring and alarm system for gamma detection in the effluent.	See comments.	If the Semiworks is started up again, a re-evaluation of the whole system will be necessary.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-S 6 Crib	Receives steam condensate from the 202-S Building.	299	Continuous effluent flow measurement. Weekly dip sample of the effluent. Monthly composite of the effluent. Analysis of samples for selected constituents in the effluent. In-line monitoring and alarm system for gamma detection in the effluent.	Same as surveillance being provided with proportional sampling instead of dip sampling of the effluent.	The monitoring system requires calibration.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-S 9* Crib	Receives process condensate from the 202-S Building.	301	Measured batch discharge to the effluent. Waste tank sample of every batch to the effluent. Monthly composite of the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

- Removed from service as of January 1, 1969.
Replaced by the 216-S 23 Crib.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-S 10 Ditch	Receives chemical sewer waste from the 202-S Building.	302	Estimated effluent discharge. Weekly dip sample of the effluent. Monthly composite of the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-S 11 Swamp	Receives liquid waste from the 216-S 10 Ditch.	303	Estimated discharge to the swamp.	See comments.	The effluent system is satisfactory.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-S 16 Swamp	Receives liquid waste from the 216-S 24 Ditch.	304	Estimated discharge to the swamp. Weekly dip sample from the east side of swamp. Analysis of samples for selected constituents in the effluent.	See comments.	If the sampling and monitoring of the S-24 influent is satisfactory, then no additional surveillance is needed.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-S 19 Swamp	Receives ventilation cooling water and waste water from the 222-S Building.	305	Measured batch discharge to the swamp. Dip sample of every batch to the effluent. Monthly composite of the effluent. Weekly dip sample northwest of the influent to swamp. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-S 21 Crib	Receives condensate from waste storage tanks in the 241-SX Tank Farm.	306	Continuous effluent flow measurement. Weekly condensate tank sample of the effluent. Monthly composite of the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-S 23* Crib	Receives process condensate from the 202-S Building.	307	Measured batch discharge to the effluent. Waste tank sample of every batch to the effluent. Monthly composite of the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

* Replaces the 216-S 9 Crib.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-S 24 Ditch	Receives concentrator cooling water from the 202-S Building.	309	Continuous effluent flow measurement. Continuous weekly sample of the effluent. Monthly composite of the effluent. Analysis of samples for selected constituents in the effluent. In-line monitoring and alarm system for gamma detection in the effluent.	Same as surveillance being provided with proportional sampling instead of dip sampling of the effluent.	The monitoring system requires calibration. The sensitivity of the monitoring system is questionable.

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LIQUID EFFLUENT STUDY
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-T 1 Ditch	Receives liquid waste from PNL operations in the 221-T Building.	311	Measured batch discharge to the effluent. Tank sample of every batch to the effluent. Dip sample of the influent to ditch. Dip sample from the ditch. Mud sample at influent to the ditch. Mud sample from the ditch. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-T 4 Swamp	Receives cooling water from the 242-T Building, cooling water and steam condensate from the 221-T Building, and decontamination waste from the 2706-W Building.	313	Estimated discharge to the swamp. Dip sample of every 242-T and 2706-W batch to the effluent. Weekly dip sample of the influent to the swamp from the retention basin. Monthly composite of the 242-T and 2706-W effluents. Analysis of samples for selected constituents in the effluents.	See comments.	It is a poor philosophy to discharge contaminated waste to open ponds.

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LIQUID EFFLUENT STUDY
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-T 19 Crib and Tile Field	Receives process and steam condensate from the 242-T Building.	315	Measured batch discharge to the effluent. Weekly waste tank sample of every batch to the effluent. Weekly sample of the condensate from the 296-T 4 Stack to the effluent. Monthly composite of the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-T 35 Crib	Receives miscellaneous laboratory waste from the 300 Area.	316	Measured batch discharge to the effluent. Waste tank car sample of every batch to the effluent. Monthly composite of the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

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LIQUID EFFLUENT STUDY
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-U 4A&B French Drain	Receives liquid waste from PNL operations in the 222-U Building.	317	None	See comments.	<p>This type of system is generally of poor design.</p> <p>An effort should be made to look for opportunities to eliminate French drains so that surveillance would not be necessary.</p>

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LIQUID EFFLUENT STUDY
WASTE MANAGEMENT SECTION

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-U 10 Swamp	Receives condenser cooling water from the 401 Building in the 241-SX Tank Farm and liquid waste from the 216-U 14 and the 216-Z 11 Ditches.	319	Continuous effluent flow measurement from the SX Tank Farm. Estimated discharge to the swamp from the U-14 and Z-11 Ditches. Weekly dip sample of the SX Tank Farm effluent. Weekly dip sample from the north and south side of the swamp. Monthly composite of the SX Tank Farm effluent. Analysis of samples for selected constituents in the effluents.	Same as surveillance being provided with proportional sampling of the SX effluent instead of dip sampling.	If the sampling of the SX, U-14, and Z-11 influent are satisfactory, then no additional surveillance is needed.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-U 14 Ditch	Receives chemical sewer waste from the 221-U Building, cooling water from the 224-U Building, waste water from the 284-W Power House, and liquid waste from the 2724-W Building.	321	Continuous effluent flow measurement from 224-U. Estimated effluent discharge from the 284-W and 2724-W. Weekly proportional sample of the 224-U effluent. Weekly dip sample of the 284-W and 2724-W effluents. Weekly and monthly composite of the 224-U effluent. Analysis of samples for selected constituents in the effluent.	Same as surveillance being provided with proportional sampling downstream of all contributors to the effluent.	Representative sampling of the influent to the U-10 Swamp is needed.

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WASTE MANAGEMENT SECTION

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<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-Z 11 Ditch	Receives cooling water, steam condensate and waste water from the 234-5 Building, cooling water and waste water from the 231-Z Building, and vacuum pump seal water from the 291-Z Building.	323	Estimated total effluent discharge. Weekly dip sample of the 234-5 and 231-Z effluents. Weekly proportional sample of the 291-Z effluent. Analysis of samples for selected constituents in the effluents.	Same as surveillance being provided with proportional sampling downstream of all potentially contaminated contributors to the effluent.	Representative sampling of the influent to the U-10 Swamp is needed.

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-Z 16 Crib	Receives liquid waste from PNL operations in the 231-Z Building.	325	Continuous effluent flow measurement. Weekly proportional sample of the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory if the waste stream is sampled properly.

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LIQUID EFFLUENT STUDY
TECHNICAL SERVICES SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-S 20* Crib	Receives liquid waste from the 222-S Building.	327	Measured batch discharges to the effluent. Waste tank sample of every batch to the effluent. Monthly composite of the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

• Inactive (standby) as of February 20, 1969.

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LIQUID EFFLUENT STUDY

CPD SERVICES SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-T 29 French Drain	Receives floor drain waste from the 291-T Building.	329	None	See comments.	An effort should be made to look for opportunities to eliminate French drains so that surveillance would not be necessary.

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LIQUID EFFLUENT STUDY

CPD SERVICES SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-T 36 Crib	Receives decontamination waste from the 221-T and 221-U Buildings.	330	Measured batch discharge to the effluent. Waste tank sample of every batch to the effluent. Monthly composite of the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

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LIQUID EFFLUENT STUDY

CPD SERVICES SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-U 7 French Drain	Receives drain waste from the 221-U Blower Pit.	331	None	See comments.	An effort should be made to look for opportunities to eliminate French drains so that surveillance would not be necessary.

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LIQUID EFFLUENT STUDY
PLUTONIUM FINISHING SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-Z 1A* Tile Field	Receives high salt aqueous and organic waste from the 242-Z Building.	333	Measured batch discharge to the effluent. Waste tank sample of every batch to the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

* Inactive as of March 6, 1969.
Replaced by 216-Z 18 Crib.

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LIQUID EFFLUENT STUDY
PLUTONIUM FINISHING SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-Z 1&2 Cribs	Receives intermittent aqueous and organic liquid waste from the 234-5, 236-Z, and the 242-Z Buildings.	334	Measured batch discharge to the effluent. Waste tank sample of every batch to the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

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LIQUID EFFLUENT STUDY
PLUTONIUM FINISHING SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-Z 12 Crib	Receives aqueous liquid waste from the 234-5, 232-Z, 236-Z and the 242-Z Buildings.	335	Measured batch discharge to the effluent. Waste tank sample of every batch to the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

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LIQUID EFFLUENT STUDY
PLUTONIUM FINISHING SECTION

<u>Designation</u>	<u>Description</u>	<u>Page</u>	<u>Surveillance Being Provided</u>	<u>Desired Surveillance</u>	<u>Comments</u>
216-Z 18* Crib	Receives high salt aqueous and organic waste from the 242-Z Building.	336	Measured batch discharge to the effluent. Waste tank sample of every batch to the effluent. Analysis of samples for selected constituents in the effluent.	See comments.	The effluent system is satisfactory.

* Replaces the 216-Z 1A Tile Field.

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APPENDIX A

THE GASEOUS EFFLUENT SYSTEMS
AND
THE ANALYTICAL PROCEDURES FOR THE GASEOUS EFFLUENT SAMPLES

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GASEOUS EFFLUENT SYSTEM

PUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
291-A 1	200-foot stack located south of the 202-A Building.	Discharges filtered ventilation air, treated and filtered vessel and condenser off-gas, and treated dissolver off-gas from the 202-A Building.	13	CVI-8264 H-2-55016K H-2-55017K

<u>CFM</u>	<u>Flow Rate Measurement</u>	<u>Rate Check</u>	<u>In-Line Monitoring and Alarm System</u>
120,000	Pitot tube in the tunnel at the base of the stack transmitting a signal to a recorder and chart in the 202-A Building Power Control Room.	Quarterly	Yes

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291-A 1 (continued)

SAMPLING

<u>Designation</u>	<u>Description</u>	<u>Sample</u>	<u>Sampler</u>	<u>Location</u>	<u>Sample Exchange</u>
ICS	Iodine caustic scrubber	Liquid	Caustic catch tank with associated monitoring.	292-A Sample House	MWF
IBS	Iodine back-up scrubber	Liquid	Four liter flask	292-A Sample House	MWF
ICC	Iodine charcoal cartridge	Charcoal	Plastic cartridge	292-A Sample House	MWF
IBC	Iodine back-up cartridge	Charcoal	Plastic cartridge	292-A Sample House	MWF
FSB	Filterable stack beta	Paper filter	Stainless steel head	292-A Sample House	MWF
E-7-4	FSB back-up	Paper filter	Duct air sample head	292-A Sample House	MWF

	<u>Air Flow</u>		
	<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>
ICS	0.6	Rotometer	Daily
IBS	0.6	Rotometer	Daily
ICC	0.6	Rotometer	Daily
IBC	0.6	Rotometer	Daily
FSB	0.5	Rotometer	Daily
E-7-4	0.5	Rotometer	Daily

<u>Designation</u>	<u>Type</u>	<u>Filter</u>	<u>Pore Size</u>
		<u>Dimensions</u>	
FSB	AAWP-47	47 mm. diameter	0.8 micron
E-7-4	HV-70	4 x 8 inches	0.3 micron

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<u>Designation</u>	<u>Page</u>	<u>Designation</u>	<u>Page</u>
ICS	241	IBC	241
IBS	241	FSB	242
ICC	241	E-7-4	242

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291-A 1 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Detector</u>			
		<u>Location</u>	<u>Type</u>	<u>Crystal</u>	<u>Sensitivity</u>
ICS (liquid effluent line from the caustic scrubber to the caustic catch tank).	Gamma continuous monitor	Located in the 292-A Sample House.	Scintillation	NaI	Gamma
BSS (effluent air from the 50-foot level of the 291-Z 1 Stack).	Beta strip sampler	Located in the 292-A Sample House.	Scintillation	NE-102	Beta and gamma

	<u>Instrumentation</u>	<u>Recorder</u>	<u>Location</u>
			<u>Instrumentation & Recorder</u>
ICS	Log-scaled count rate meter	Linear scaled	Located behind the head end control room in the 202-A Building.
BSS	Linear count rate meter	Linear scaled	Located behind the head end control room in the 202-A Building.

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Calibration</u>
ICS	Located in the dispatcher's office in the 202-A Building.	Audio and visual	Manual	Not available
BSS	Located in the dispatcher's office in the 202-A Building.	Audio and visual	Manual	Not Available

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GASEOUS EFFLUENT SYSTEM

PUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-A 1	Located at the northwest side of the 202-A Building.	Discharges filtered air from N and Q cells, and the PR Room.	14	H-2-52324K H-2-59555 H-2-62864

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
7,000	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
E-1	Paper filter	HV-70	4 x 8 inches	0.3 micron	Duct air sample head	Located at the stack.

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296-A 1 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow</u> <u>Measurement</u>	<u>Rate Check</u>	<u>Sample</u> <u>Exchange</u>
E-1	5	Magnahelic gauge across the influent and the effluent line of the sampler.	Non-routine request	Weekly

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<u>Designation</u>	<u>Page</u>
E-1	242

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GASEOUS EFFLUENT SYSTEM

PUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-A 2	Located at the southwest corner of the 202-A Building.	Discharges filtered hood exhaust air from the west sample gallery.	15	H-2-52328K

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
4,300	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
E-2	Paper filter	HV-70	4 x 8 inches	0.3 micron	Duct air sample head	Located at the stack.

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296-A 2 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow</u> <u>Measurement</u>	<u>Rate Check</u>	<u>Sample</u> <u>Exchange</u>
E-2	5	Magnahelic gauge across the influent and the effluent line of the sampler.	Non-routine request	Weekly

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GASEOUS EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-A 3	Located near the northeast side (stairwell #13) of the 202-A Building.	Discharges filtered hood exhaust air from the east sample gallery.	16	H-2-52326K

<u>CFM</u>	<u>Flow Rate Measurement</u>	<u>Rate Check</u>	<u>In-Line Monitoring and Alarm System</u>
4,500	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Type</u>	<u>Filter Dimensions</u>	<u>Pore Size</u>	<u>Sampler</u>	<u>Location</u>
E-3	Paper filter	HV-70	4 x 8 inches	0.3 micron	Duct air sample head.	Located at the stack.

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296-A 3 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow</u> <u>Measurement</u>	<u>Rate Check</u>	<u>Sample</u> <u>Exchange</u>
E-3	5	Magnahelic gauge across the influent and the effluent line of the sampler.	Non-routine request	Weekly

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<u>Designation</u>	<u>Page</u>
E-3	242

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GASEOUS EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-A 5	Located on the roof of the 202-A Laboratory Annex.	Discharges filtered air from the 202-A Analytical Laboratory hoods and glove boxes.	17	SK-2-3132

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
23,000	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
E-5	Paper filter	HV-70	4 x 8 inches	0.3 micron	Duct air sample head	Located at the effluent duct to the stack in the 202-A Ventilation Equipment Room.

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296-A 5 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>	
E-5	5	Magnahelic gauge across the influent and the effluent line of the sampler.	Weekly

Rate Check
Non-routine request

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GASEOUS EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-A 6	Located on the northeast side (stairwell #13) of the 202-A Building.	Discharges unfiltered air from the east sample gallery and U Cell.	18	SK-2-18675 H-2-52309 H-2-52313 H-2-52316

<u>CFM</u>	<u>Flow Rate Measurement</u>	<u>Rate Check</u>	<u>In-Line Monitoring and Alarm System</u>
13,000	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Type</u>	<u>Filter Dimensions</u>	<u>Filter Pore Size</u>	<u>Sampler</u>	<u>Location</u>
E-6	Paper filter	HV-70	4 x 8 inches	0.3 micron	Duct air sample head	Located at the stack.

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296-A 6 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow Measurement</u>	<u>Rate Check</u>	<u>Sample Exchange</u>
E-6	5	Magnahelic gauge across the influent and the effluent line of the sampler.	Non-routine request	Weekly

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<u>Designation</u>	<u>Page</u>
E-6	242

GASEOUS EFFLUENT SYSTEM

PUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-A 7	Located at the southwest corner of the 202-A Building.	Discharges unfiltered air from the west sample gallery and R Cell.	19	SK-2-18678 H-2-52313

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
20,000	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
E-7	Paper filter	HV-70	4 x 8 inches	0.3 micron	Duct air sample head	Located at the stack.

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296-A 7 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow Measurement</u>	<u>Rate Check</u>	<u>Sample Exchange</u>
E-7	5	Magnahelic gauge across the influent and the effluent line of the sampler.	Non-routine request	Weekly

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<u>Designation</u>	<u>Page</u>
E-7	242

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GASEOUS EFFLUENT SYSTEM

PUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-A 8 (White Room)	Located at the northwest corner of the 202-A Building.	Discharges unfiltered air from the west end of the P&O Gallery.	20	SK-2-18677 H-2-3113

<u>CFM</u>	<u>Flow Rate</u>		<u>In-Line Monitoring and Alarm System</u>
	<u>Measurement</u>	<u>Rate Check</u>	
17,000	None	Non-routine request	None

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SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
Rack 73	Paper filter	HV-70	4 x 8 inches	0.3 micron	Room air sample head	Located in the white room at the west end of the P&O Gallery.

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296-A 8 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow</u> <u>Measurement</u>	<u>Rate Check</u>	<u>Sample</u> <u>Exchange</u>
Rack 73	5	Inches of water gauge on the effluent line of the sampler.	Non-routine request	Weekly

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<u>Designation</u>	<u>Page</u>
Rack 73	242

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GASEOUS EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-A 10	Located at the south end of the 202-A Building Equipment Disposal Tunnel #2.	Discharges filtered air from disposal tunnel #2.	21	H-2-98134

In-Line Monitoring and Alarm System

<u>CFM</u>	<u>Flow Rate</u>		<u>Rate Check</u>
	<u>Measurement</u>	<u>None</u>	
9,800	None	Non-routine request	

None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>		<u>Pore Size</u>	<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>			
BT-2	Paper filter	HV-70	4 x 8 inches	0.3 micron	Duct air sample head	Located at the stack.

296-A 10 (continued)
 SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
BT-2	5	Magnahelic gauge across the influent and the effluent line of the sampler.	Non-routine request	Weekly

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<u>Designation</u>	<u>Page</u>
BT-2	242

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GASEOUS EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-A 14	Located on the roof of the 293-A Back-Up Facility.	Discharges filtered air from the 293-A Building.	22	H-2-57011

In-Line Monitoring and Alarm System

None

<u>CFM</u>	<u>Flow Rate</u>		<u>Rate Check</u>
	<u>Measurement</u>	<u>None</u>	
6,000	None	Non-routine request	

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>		<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>		
E-10	Paper filter	HV-70	4 x 8 inches	Room air sample head	Located in the 293-A Building.

296-A 14 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow</u> <u>Measurement</u>	<u>Rate Check</u>	<u>Sample</u> <u>Exchange</u>
E-10	5	Inches of water gauge on the effluent line of the sampler.	Non-routine request	Weekly

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<u>Designation</u>	<u>Page</u>
E-10	242

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CASEOUS EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Sampling</u>	<u>Reference Drawing</u>
296-A 15 Vent	Located on the roof of the 203-A Building.	Filters vessel vent off gas from the UNH Storage Tanks.	23	None	H-2-54800 H-2-58431 H-2-58617
296-A 16 Vent	Located southwest of the 291-A Building.	Unfiltered vessel vent off gas from the 216-A-2 Tank.	22	None	H-2-55036 H-2-55056

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GASEOUS EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-U 2	Located on the roof of the 224-UA Building.	Discharges filtered ventilation air from the depleted UO_3 Calciner Facility.	24	H-2-44209

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
1,100	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
X-31-1 (601) and X-31-2 (602)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located at the stacks.

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296-U 2 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow</u> <u>Measurement</u>	<u>Rate Check</u>	<u>Sample</u> <u>Exchange</u>
X-31-1* and X-31-2	5	None	Monthly	Daily

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<u>Designation</u>	<u>Page</u>
X-31-1	247
X-31-2	247

*Only one exhaust operating at a time.

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GASEOUS EFFLUENT SYSTEM

PUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-U 3	Located on the roof of the 224-U Building.	Discharges filtered ventilation air from the enriched UO_3 Calciner Facility.	25	H-2-50048

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
1,000	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
X-13 (603)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located at the stack.

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296-U 3 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
X-13	4	None	Monthly	Daily

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
X-13	247

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GASEOUS EFFLUENT SYSTEM

PUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-U 4	Located on the roof of the 224-U Building.	Discharges unfiltered off gas from the UO ₂ Plant and absorber and UNH concentrator.	26	H-2-44234

<u>Flow Rate</u>		<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>			
2,000	None	Non-routine request	None	None

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GASEOUS EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-U 5	Located on the roof of the 224-U Building.	Discharges filtered air from the Thorium pot in F Cell.	27	H-2-44001

In-Line Monitoring and Alarm System

None

<u>CFM</u>	<u>Flow Rate</u>	
	<u>Measurement</u>	<u>Rate Check</u>
660	None	Non-routine request

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>		<u>Sampler</u>	<u>Location</u>
		<u>Dimensions</u>	<u>Pore Size</u>		
F Cell (612)	Paper filter	4 inch diameter	0.3 micron	Duct air sample head	Located at the stack.

296-U 5 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow</u> <u>Measurement</u>	<u>Rate Check</u>	<u>Sample</u> <u>Exchange</u>
F Cell	3	None	Monthly	Daily

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<u>Designation</u>	<u>Page</u>
F Cell	247

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GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

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<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-A 11 [*]	Located on the roof of the 431 Condenser Building in the 241-A Tank Farm.	Discharges filtered noncondensable vapors from waste storage tanks in the 241-A and AX Tank Farms.	29	H-2-62991

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
1,300	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
AFS ^{**}	Paper filter	HV-70	2 inch diameter	0.3 micron	Millipore sampler	Located at the stack.

^{*}Inactive (standby) as of March 18, 1969.
Replaced by 296-A 17.

^{**}No continuous sampling as the result of an unresolved condensate collection problem on the sample.

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296-A 11 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
AFS	5	None	Monthly when sampling.	Daily when sampling.

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
AFS	244

GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-A 12	Located on the north side at the west end of the 244-AR Vault.	Discharges filtered off gas from the process vessel ventilation system of the AR Vault.	30	H-2-62028

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
700	None	Non-routine request	Yes

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
ARVVS	Paper filter	HV-70	2 inch diameter	0.3 micron	Enclosed air filter sampler with associated monitoring.	Located at the stack.
ARVVI	Charcoal	---	---	---	Charcoal cartridge	Located at the stack.

--- Not applicable

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296-A 12 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>			<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
ARVVS and ARVVI	3	Rotometer	Daily	Weekly

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
ARVVS	244
ARVVI	241

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296-A 12 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Location</u>	<u>Detector Type</u>	<u>Sensitivity</u>
ARVVS	Beta-gamma continuous monitor	Located at the stack.	Ionization	Beta and gamma
	<u>Instrumentation</u>	<u>Recorder</u>	<u>Location</u>	<u>Instrumentation and Recorder</u>
	Linear count rate meter	Linear scaled	Located in the control room of the 244-AR Vault.	

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Isotope</u>	<u>Calibration Lower Detection Limit</u>
ARVVS	Located in the control room of the 244-AR Vault.	Audio and visual	Manual	¹³⁷ Cs-Ba	14 x 10 ⁻⁶ Ci/week
				¹⁰⁶ Ru-Rh	14 x 10 ⁻⁶ Ci/week
				⁹⁰ Sr*	4 x 10 ⁻⁶ Ci/week
				⁹⁵ Zr-Nb	70 x 10 ⁻⁶ Ci/week

Release Guide

5 x 10⁻² Ci/week ⁹⁰Sr, 1 Ci/week total of others except ³H, ¹⁴C, and noble gases.

* ⁹⁰Sr is in equilibrium decay with ⁹⁰Y.

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GASEOUS EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-A 13	Located on the north side at the east end of the 244-AR Vault.	Discharges filtered ventilation air from the AR Vault.	31	H-2-62028

In-Line Monitoring and Alarm System

Yes

<u>CFM</u>	<u>Flow Rate Measurement</u>	<u>Rate Check</u>
24,000	None	Non-routine request

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Type</u>	<u>Filter Dimensions</u>	<u>Pore Size</u>	<u>Sampler</u>	<u>Location</u>
ARCS	Paper filter	HV-70	2 inch diameter	0.3 micron	Enclosed air filter sampler with associated monitoring.	Located at the stack.
ARCI	Charcoal	---	---	---	Charcoal cartridge	Located at the stack.

--- Not applicable

296-A 13 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
ARCS and ARCI	2	Rotometer	Daily	Weekly

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
ARCS	244
ARCI	241

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296-A 13 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>
ARCS	Beta-gamma continuous monitor

<u>Location</u>	<u>Detector Type</u>	<u>Sensitivity</u>
Located at the stack.	Ionization	Beta and gamma

<u>Instrumentation</u>
Linear count rate meter

<u>Recorder</u>	<u>Location</u>
Linear scaled	Instrumentation and Recorder Located in the control room of the 244-AR Vault.

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>
ARCS	Located in the control room of the 244-AR Vault.

<u>Response</u>
Audio and visual

<u>Reset</u>
Manual

<u>Calibration</u>	
<u>Isotope</u>	<u>Lower Detection Limit</u>
¹³⁷ Cs-Ba	11 x 10 ⁻⁵ Ci/week
¹⁰⁶ Ru-Rh	9 x 10 ⁻⁵ Ci/week
⁹⁰ Sr*	5 x 10 ⁻⁵ Ci/week
⁹⁵ Zr-Nb	70 x 10 ⁻⁵ Ci/week

Release Guide

1 x 10⁻² Ci/week ⁹⁰Sr, 0.2 Ci/week
Total of others except ³H, ¹⁴C, and noble gases.

- ⁹⁰Sr is in equilibrium decay with ⁹⁰Y.

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GASEOUS EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-A 17*	Located on the east side of the 702 Vent. Fan Building at the 241-A Tank Farm.	Discharges filtered noncondensable vapors from waste storage tanks in the 241-A and AX Tank Farms.	32	H-2-62883 H-2-62896

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
5,300	None	Non-routine request	Yes

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
AXFS	Paper filter	HV-70	2 inch diameter	0.3 micron	Millipore sampler	Located at the stack.

*Replaces the 296-A 11 Stack.

296-A 17 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>			<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
AXFS	3	Rotometer	Daily	Daily

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
AXFS	244

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296-A 17 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>
AXFS	Beta-gamma continuous monitor

<u>Location</u>	<u>Detector Type</u>	<u>Sensitivity</u>
Located at the stack.	Ionization	Beta and gamma

<u>Instrumentation</u>
Linear count rate meter

<u>Recorder</u>	<u>Location Instrumentation and Recorder</u>
Linear scaled	Located in the 271 Control House at the 241-A Tank Farm.

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>
AXFS	Located in the 271 Control House at the 241-A Tank Farm.

<u>Response</u>	<u>Reset</u>	<u>Calibration</u>
Audio and visual	Manual	Has not been calibrated. (Source checks, bugging, etc., cannot be construed to be calibrations.)

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GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
291-B 1	200-foot stack located south of the 271-B Building.	Discharges filtered ventilation air and process vent off gas from the 221-B Building.	33	CVI-70174

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
55,000	None	Quarterly	Yes

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
BPS	Paper filter	AAWP-47	47 mm. diameter	0.8 micron	Enclosed air filter sampler with associated monitoring.	Located in the 292-B Building.

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291-B 1 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
BPS	3	Magnahelic gauge to a flow indicator on the effluent line of the sampler.	Monthly	Daily

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
BPS	244

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291-B 1 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Location</u>	<u>Type</u>	<u>Detector</u> <u>Crystal</u>	<u>Sensitivity</u>
BPS	Gamma continuous monitor	Located in the 292-B Building.	Scintillation	NaI	Beta and gamma

<u>Instrumentation</u>	<u>Recorder</u>	<u>Location</u> <u>Instrumentation and Recorder</u>
Log-scaled count rate meter	Log-scaled	Located in the 292-B Building.

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Calibration</u>
BPS	Located in the 292-B Building and the dispatcher's office in the 271-B Building.	Audio and visual	Manual	Has not been calibrated. (Source checks, bugging, etc., cannot be construed to be calibrations.)

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GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-B 2	Located on the east side of the 241-BY Tank Farm.	Discharges filtered process off gas from the In-Tank Solidification Unit #1.	34	H-2-32280 H-2-32841

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
3,500	None	Non-routine request	Yes

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
BYS-1	Paper filter	HV-70	2 inch diameter	0.3 micron	Enclosed air filter sampler with associated monitoring.	Sampler station located at the ITS Unit #1.

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296-B 2 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>	
BYS-1	1	Rotometer	Daily

Rate Check
Daily

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
BYS-1	244

296-B 2 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Location</u>	<u>Detector Type</u>	<u>Sensitivity</u>
BYS-1	Beta-gamma continuous monitor	Located at the sampler station.	Ionization	Beta and gamma

<u>Instrumentation</u>	<u>Recorder</u>	<u>Location</u> <u>Instrumentation and Recorder</u>
Linear count rate meter	Linear scaled	Located in the 301 Control House for the ITS Unit #1.

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Calibration</u>
BYS-1	Located in the 301 Control House for the ITS Unit #1.	Audio and visual	Manual	Has not been calibrated. (Source checks, bugging, etc., cannot be construed to be calibrations.)

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WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-B 3	Located on the west side of the 241-BY Tank Farm.	Discharges filtered process off- gas from the In-Tank Solidification Unit #2.	35	H-2-62451

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
400	None	Non-routine request	Yes

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
BYS-2	Paper filter	HV-70	2 inch dia- meter	0.3 micron	Enclosed air filter sampler with associ- ated monitoring.	Located at the stack.

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296-B 3 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
BYS-2	2	Rotometer	Daily	Daily

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<u>Designation</u>	<u>Page</u>
BYS-2	244

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296-B 3 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Location</u>	<u>Detector Type</u>	<u>Sensitivity</u>
BYS-2	Beta-gamma continuous monitor	Located at the stack.	Ionization	Beta and gamma

<u>Instrumentation</u>	<u>Recorder</u>	<u>Location</u> <u>Instrumentation and Recorder</u>
Linear count rate meter	Linear scaled	Located in the 25 ⁴ Control House for the ITS Unit #2.

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Calibration</u>
BYS-2	Located in the 25 ⁴ Control House for the ITS Unit #2.	Audio and visual	Manual	Has not been calibrated. (Source checks, bugging, etc., cannot be construed to be calibrations.)

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GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-B 5	Located at the northeast corner of the 221-B Building.	Discharges filtered air from the 221-BB Building.	36	H-2-60579

<u>Flow Rate</u>		<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>			
1,000	None	Non-routine request	None	None

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GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-B 6	Located at the southwest corner of the 241-BY Tank Farm.	Discharges filtered vent off-gas from waste storage tanks in the 241-BY Tank Farm.	37	H-2-34268

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
7,000	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
BYS-3	Paper filter	HV-70	2 inch diameter	0.3 micron	Millipore sampler	Located at the stack.

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296-B 6 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
BYS-3	5	None	Monthly	Daily

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<u>Designation</u>	<u>Page</u>
BYS-3	244

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GASEOUS EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
291-C 1	200-foot stack located west of the 291-C Building.	Discharges filtered process vent and filtered ventilation air from the 201-C Building.	38	CVI-70174 H-2-4419

In-Line Monitoring and Alarm System

<u>CFM</u>	<u>Flow Rate</u>		<u>Rate Check</u>
	<u>Measurement</u>	<u>None</u>	
20,000		None	Non-routine request

Yes

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>		<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>		
SWS	Paper filter	AAMP-47	47 mm. diameter	Enclosed air filter sampler with associated monitoring.	Located in the 291-C Building.

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291-C 1 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
SWS	5	None	Monthly	Daily

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<u>Designation</u>	<u>Page</u>
SWS	244

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291-C 1 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Location</u>	<u>Detector</u> <u>Type</u>	<u>Crystal</u>	<u>Sensitivity</u>
SWS	Beta-gamma continuous monitor	Located in the 291-C Building.	Scintillation	NE-102	Beta and gamma

<u>Instrumentation</u>	<u>Recorder</u>	<u>Location</u> <u>Instrumentation and Recorder</u>
Linear count rate meter	Linear scaled	Located in the 291-C Building.

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Calibration</u>
SWS	Located in the 291-C Building and the dispatcher's office in the 271-B Building.	Audio and visual	Manual	Has not been calibrated. (Source checks, bugging, etc., cannot be construed to be calibrations.)

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GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-C 2	Located on the roof of the annex connecting the 281-C and the 201-C Buildings.	Discharges filtered air from the A and C Sample Galleries in the 201-C Building.	39	H-2-4415

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
8,000	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
WPS	Paper filter	HV-70	2 inch diameter	0.3 micron	Millipore sampler	Located in the A Sample Gallery

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296-C 2 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow</u> <u>Measurement</u>	<u>Rate Check</u>	<u>Sample</u> <u>Exchange</u>
WPS	5	None	Monthly	Weekly

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
WPS	244

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GASEOUS EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-C 5	Located at the southeast corner of the 241-C Tank Farm.	Discharges filtered ventilation air from the 241-CR Vault and the vault vessel vent system.	40	H-2-33279

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
3,500	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
CRV	Paper filter	HV-70	2 inch diameter	0.3 micron	Millipore sampler	Sampler station located at the stack.

296-C 5 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
CRV	5	Inches of water gauge on the influent and the effluent line of the sampler.	Monthly	Daily

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
CRV	244

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GASEOUS EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
291-S 1	200-foot stack located east of the 202-S Building.	Discharges filtered ventilation air and vessel vent off gas from the 202-S Building.	41	CVI-70174

In-Line Monitoring and Alarm System

Yes

<u>CFM</u>	<u>Flow Rate</u>		<u>Rate Check</u>
	<u>Measurement</u>	<u>None</u>	
36,000	None	Quarterly	

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>		<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Pore Size</u>		
91-F (001)	Paper filter	HV-70	0.3 micron	Stainless steel flange head sampler	Located in the 2711-S Sample House.

291-S 1 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
91-F	1	Flow indicator	Monthly	Daily

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<u>Designation</u>	<u>Page</u>
91-F	247

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296-A 12 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Location</u>	<u>Type</u>	<u>Detector</u> <u>Crystal</u>	<u>Sensitivity</u>
BSS	Beta strip sampler	Located in the 2711-S Sample House.	Scintillation	NE-102	Beta and gamma

<u>Instrumentation</u>	<u>Recorder</u>	<u>Instrumentation Location</u>	<u>Recorder Location</u>
Linear count rate meter	Linear scaled	Located in the 2711-S Sample House.	Located at the north sample gallery in the 202-S Building.

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Calibration</u>
BSS	Located at the north sample gallery and the dispatcher's office in the 202-S Building.	Audio and visual	Manual	Has not been calibrated. (Source checks, bugging, etc., cannot be construed to be calibrations.)

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GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-S 1	Located at the southeast corner of the 202-S Building.	Discharges filtered air from the south sample gallery and sampler hoods.	42	H-2-7561

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
3,500	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
X-1 (029)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located at the J Section of the south pipe gallery.

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296-S 1 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
X-1	3	Inches of water guage on the effluent line of the sampler.	Monthly	Weekly

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X-1	247

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GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-S 2	Located at the northeast corner of the 202-S Building.	Discharges filtered air from the north sample gallery and sampler hoods.	43	H-2-7550 H-2-7560

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
3,500	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
X-2 (016)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located at the C Section of the north pipe gallery.

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296-S 2 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
X-2	3	Inches of water gauge on the effluent line of the sampler.	Monthly	Weekly

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
X-2	247

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GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-S 4	Located at the east end of the 202-S Building.	Discharges filtered air from the decontamination room and regulated shop, and unfiltered air from the regulated tool room, low level decontamination sink and the SWP Lobby.	44	H-2-7549 H-2-7554

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
2,200	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
EF-3	Paper sample	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located at the decontamination room exhaust fan #3.

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296-S 4 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow</u> <u>Measurement</u>	<u>Rate Check</u>	<u>Sample</u> <u>Exchange</u>
EF-3	3	Inches of water guage on the effluent line of the sampler.	Monthly	Weekly

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
EF-3	247

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GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-S 5	Located on the roof of the 202-S Silo.	Discharges filtered air from the product removal cage.	45	H-2-5742

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
1,800	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
PR-33 (017)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located at the E Section of the north sample gallery.

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296-S 5 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>	
PR-33	3	Inches of water guage on the effluent line of the sampler.	Weekly

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<u>Designation</u>	<u>Page</u>
PR-33	247

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GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-S 6	Located at the west end of the 202-S Building.	Discharges unfiltered air from the silo gallery, organic feed tank and sample elevator.	46	H-2-7581

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
10,600	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
8-X (002)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sampler head	Located at the eighth level AMU.

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296-S 6 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>	
8-X	3	Inches of water guage on the effluent line of the sampler.	Weekly

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
8-X	247

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GASEOUS EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-S 7	Located at the north end of the 233-S Loadout Facility.	Discharges filtered ventilation air from the 233-S Building.	47	H-2-17900 H-2-17905

<u>CFM</u>	<u>Flow Rate Measurement</u>	<u>Rate Check</u>	<u>In-Line Monitoring and Alarm System</u>
7,700	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>	<u>Sampler</u>	<u>Location</u>		
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
KX-3 (101) and KX-4 (102)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located in the 233-S Access Room.

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296-S 7 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
KX-3 and KX-4*	3	Inches of water guage on the influent and the effluent line of the samplers.	Monthly	Weekly

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<u>Designation</u>	<u>Page</u>
KX-3	247
KX-4	247

*KX-3 and 4 used on alternate weeks.

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GASEOUS EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-S 14	Located at the 401 Building in the 241-SX Tank Farm.	Discharges filtered condenser vent off-gas from waste storage tanks in the SX Tank Farm.	48	H-2-33696

<u>CFM</u>	<u>Flow Rate</u>		<u>In-Line Monitoring and Alarm System</u>
	<u>Measurement</u>	<u>Rate Check</u>	
600	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
CE-1 (901)*	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located at the stack.

*Sampler not re-installed after modifications of the effluent system were completed in October, 1968.

296-S 14 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
CE-1	3	None	Monthly after sampler is installed.	Weekly after installation.

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<u>Designation</u>	<u>Page</u>
CE-1	247

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GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-S 15	Located in the center of the 241-SX Tank Farm.	Discharges filtered vent off-gas from waste storage tanks in the SX Tank Farm.	49	H-2-33696

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
7,000	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
SX-1 (902)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located at the stack.

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296-S 15 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow</u> <u>Measurement</u>	<u>Rate Check</u>	<u>Sample</u> <u>Exchange</u>
SX-1	1	None	Monthly	Daily

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
SX-1	247

GASEOUS EFFLUENT SYSTEMWASTE MANAGEMENT SECTIONReference DrawingPageFunctionLocationDesignationH-2-42026
H-2-42027

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Discharges unfiltered air from the
hot cells in the 242-T Facility.Located on the south side of the
242-T Waste Evaporator Facility.

296-T 1

In-Line Monitoring
and Alarm System

None

<u>CFM</u>	<u>Flow Rate</u>		<u>Rate Check</u>
	<u>Measurement</u>		
800	None		Non-routine request

SAMPLINGLocationSamplerPore SizeFilter
DimensionsTypeSample

Located at the stack.

Duct air sample
head

0.3 micron

4 inch diameter

HV-70

Paper filter

Designation

EVP-1 (301)

296-T 1 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
EVP-1	3	None	Monthly	Daily

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<u>Designation</u>	<u>Page</u>
EVP-1	247

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GASEOUS EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-T 2	Located on the northeast corner of the 242-T Waste Evaporator Facility.	Discharges unfiltered air from the waste catch tank cell in the 242-T Facility.	51	H-2-2014

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
800	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
EVP-2 (302)	Paper filter	HV-70	4 inch diameter	0.3 micron	Room air sample head	Located in the waste catch tank cell.

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296-T 2 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
EVP-2	3	None	Monthly	Daily

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<u>Designation</u>	<u>Page</u>
EVP-2	247

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GASEOUS EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-T 4	Located at the north end of the 241-TX Tank Farm.	Discharges filtered vent off-gas from waste storage tanks in the TX Tank Farm.	52	H-2-33082 H-2-33083

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
7,000	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
TX-1 (305)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located at the stack.

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296-T 4 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
TX-1	1	None	Monthly	Daily

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<u>Designation</u>	<u>Page</u>
TX-1	247

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GASEOUS EFFLUENT SYSTEMTECHNICAL SERVICES SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-S 13	Located on the roof of the 222-S Building.	Discharges filtered air from all the hoods, glove boxes, hot cells, and filtered ventilation air.	53	H-11-4430 H-11-4431

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
96,500	None	Quarterly	Yes

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
Stack Breech (201)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head with associated monitoring.	Located at the stack plenum in the 222-S Attic.
Alpha Monitor	Paper filter	HV-70	2 inch diameter	0.3 micron	Enclosed air filter sampler with associated monitoring.	Located at the stack plenum in the 222-S Attic.

296-S 13 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow</u> <u>Measurement</u>	<u>Rate Check</u>	<u>Sample</u> <u>Exchange</u>
Stack Breech	6	Inches of water gauge on the effluent line of the sampler.	Monthly	Daily
Alpha Monitor	3	Rotometer	Daily	Weekly*

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
Stack Breech	247
Alpha Monitor	247

* Sample pulled and analyzed only when high activity alarm is activated. Otherwise paper filter is exchanged each week but not analyzed.

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296-S 13 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Detector</u>			
		<u>Location</u>	<u>Type</u>	<u>Crystal</u>	<u>Sensitivity</u>
Stack Breech	Continuous beta-gamma monitor	222-S stack plenum	Ionization	---	Beta and gamma
Alpha Monitor	Continuous beta-gamma monitor	222-S stack plenum	Scintillation	ZnS	Alpha

<u>Instrumentation</u>	<u>Recorder</u>	<u>Instrumentation Location</u>	<u>Recorder Location</u>
Linear count rate meter	Linear scaled	222-S stack plenum	Radiation Monitoring office in the 222-S Building.

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Calibration</u>
Stack Breech and Alpha Monitor	Radiation Monitoring office in the 222-S Building.	Audio and visual	Manual	Has not been calibrated. (Source checks, bugging, etc., cannot be construed to be calibrations.)

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GASEOUS EFFLUENT SYSTEMTECHNICAL SERVICES SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-S 16	Located at the northwest corner of the 219-S Vault.	Discharges filtered exhaust air from the 219-S Waste Tanks and Vault.	54	H-2-5231

In-Line Monitoring and Alarm System

<u>CFM</u>	<u>Flow Rate</u>		<u>Rate Check</u>
	<u>Measurement</u>		
100	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>		<u>Pore Size</u>	<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>			
219-S (264)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located at the stack.

296-S 16 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
219-S	2	None	Monthly	Weekly

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219-S	247

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CASEOUS EFFLUENT SYSTEM

CPD SERVICES SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawings</u>
291-T 1	200-Foot stack located south-east of the 221-T Building.	Discharges both filtered and unfiltered ventilation air from the 221-T Building.	55	CVI-7017 ⁴

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
36,000	None	Non-routine request	None*

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
291-T (401)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located in the 291-T Building
Section 11 (402), Section 15 (403), and Section 20 (404)*	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample heads	Located at sections 11, 15, and 20 in the operating gallery of the 221-T Building.

- * Sections 11, 15, and 20 have associated in-line monitoring and alarm systems.

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291-T 1 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
291-T	3	Inches of water gauge on the influent and the effluent line of the sampler.	Monthly	Daily
Section 11 Section 15, and Section 20	3	Inches of water gauge on the influent and the effluent line of the sampler.	Monthly	Weekly

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<u>Designation</u>	<u>Page</u>
291-T	247
Section 11	247
Section 15	247
Section 20	247

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291-T 1 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Location</u>	<u>Detector Type</u>	<u>Sensitivity</u>
Section 11, Section 15, and Section 20	Gamma continuous monitor	Respective section locations in the 221-T Operating Gallery.	Ionization	Beta and gamma
	<u>Instrumentation</u>	<u>Recorder</u>	<u>Instrumentation Location</u>	<u>Recorder Location</u>
	Linear count rate meter	Linear scaled	Respective section locations in the 221-T Operating Gallery.	Radiation Monitoring office at the west end of the 221-T Operating Gallery.

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Calibration</u>
Section 11, Section 15, and Section 20	Radiation Monitoring office at the west end of the 221-T Operating Gallery.	Audio and visual	Manual	Has not been calibrated. (Source checks, bugging, etc., cannot be construed to be calibrations.)

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GASEOUS EFFLUENT SYSTEM

CPD SERVICES SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-T 7*	Located on the west side of the 2706-W Decontamination Facility.	Discharges unfiltered air from the railway and automotive pits in the 2706-W Building.	56	H-2-3798

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
5,000	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Type</u>	<u>Filter Dimensions</u>	<u>Pore Size</u>	<u>Sampler</u>	<u>Location</u>
Location 1(502) and Location 2(503)	Paper filter	HV-70	4 inch dia-meter	0.3 micron	Room air sample heads	Located in the 2706-W Building at each end of the railway pit.

* Activated only during use of solvents for decontamination operations. Otherwise, the building effluent air flows out of the doors.

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296-T 7 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow</u> <u>Measurement</u>	<u>Rate Check</u>	<u>Sample</u> <u>Exchange</u>
Location 1&2	3	None	Monthly	Daily

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Location 1	247
Location 2	247

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GASEOUS EFFLUENT SYSTEMCPD SERVICES SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
291-U 1	200-foot stack located southeast of the 221-U Building.	Discharges filtered ventilation air from the 221-U Canyon.	57	CVI-70174

In-Line Monitoring and Alarm System

<u>CFM</u>	<u>Flow Rate Measurement</u>	<u>Rate Check</u>
27,500	None	Non-routine request

None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Type</u>	<u>Filter Dimensions</u>	<u>Pore Size</u>	<u>Sampler</u>	<u>Location</u>
291-U (701) *	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located in the 291-U Building.
Section 5(702) and Section 19(703)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample heads	Located at sections 5 and 19 in the operating gallery of the 221-U Building.

* Activated only when the canyon conditions over a seven-day period indicate assault mask status.

291-U 1 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
291-U	3	Inches of water gauge on the influent and the effluent line of the sampler.	Monthly when sampling.	Daily when sampling.
Section 5 and Section 19	3	Inches of water gauge on the influent and the effluent line of the sampler.	Monthly	Weekly

ANALYTICAL PROCEDURE

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GASEOUS EFFLUENT SYSTEMCPD SERVICES SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-U 6 *	Located in the 241-WR Exclusion Area.	Discharges unfiltered ventilation air from the cold side of the WR Vault.	58	H-2-40744

In-Line Monitoring and Alarm System

<u>CFM</u>	<u>Flow Rate Measurement</u>	<u>Rate Check</u>
10,000	None	Non-routine request

None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Type</u>	<u>Filter Dimensions</u>	<u>Pore Size</u>	<u>Sampler</u>	<u>Location</u>
241-WR(621)	Paper filter	HV-70	4 inch diameter	0.3 micron	Duct air sample head	Located at the stack.

* Activated only during Thorium storage.

296-U 6 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>CFM</u>	<u>Air Flow</u> <u>Measurement</u>	<u>Rate Check</u>	<u>Sample</u> <u>Exchange</u>
241-WR	3	None	Monthly when sampling.	Weekly when sampling.

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GASEOUS EFFLUENT SYSTEM
PLUTONIUM FINISHING SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
291-Z 1	200-foot stack located south of the 234-5 Building.	Discharges filtered process and ventilation air from the 234-5, 232-Z, 236-Z, and the 242-Z Buildings.	59	CVI-312

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
240,000	None	Non-routine request	Yes

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
291-Z	Paper filter	AN-3000	47 mm. diameter	3 micron	Enclosed air filter sampler	Located at the 291-Z plenum level.

291-Z 1 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
291-Z 1	1.5	Rotometer	Daily	Daily

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291-Z 1 (continued)

<u>Designation</u>	<u>Monitor</u>
291-Z	Alpha continuous monitor

<u>Instrumentation</u>
Linear count rate meter

IN-LINE MONITORING

<u>Detector</u>			
<u>Location</u>	<u>Type</u>	<u>Crystal</u>	<u>Sensitivity</u>
291-Z plenum level	Scintillation	Silicon barrier	Alpha

<u>Recorder</u>	<u>Location</u> <u>Instrumentation and Recorder</u>
Linear scaled	291-Z plenum level

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Calibration</u>
291-Z	291-Z plenum level	Audio and visual	Manual	Has not been calibrated. (Source checks, bugging, etc., cannot be construed to be calibrations.)

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GASEOUS EFFLUENT SYSTEM
PLUTONIUM FINISHING SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
296-Z 3	Located at the west end of the 241-Z Sump Area.	Discharges filtered air from the cells and vent off-gas from the tanks of the 241-Z Sump.	60	H-2-43552

<u>Flow Rate</u>			<u>In-Line Monitoring and Alarm System</u>
<u>CFM</u>	<u>Measurement</u>	<u>Rate Check</u>	
1,500	None	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Sample</u>	<u>Filter</u>			<u>Sampler</u>	<u>Location</u>
		<u>Type</u>	<u>Dimensions</u>	<u>Pore Size</u>		
241-Z	Paper filter	HV-70	4 x 4 inches	0.3 micron	Duct air sample head	Located on the west side of the 241-Z Sump.

296-Z 3 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Air Flow</u>		<u>Rate Check</u>	<u>Sample Exchange</u>
	<u>CFM</u>	<u>Measurement</u>		
241-Z	2.5	Rotometer	Weekly	Weekly

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
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PUREX ANALYTICAL LABORATORY
ANALYTICAL PROCEDURES FOR GASEOUS EFFLUENTS

<u>Sample Designation</u>	<u>Page</u>	<u>Counter</u>	<u>Detector</u>			<u>Detection</u>		
			<u>Type</u>	<u>Crystal</u>	<u>Sensitivity</u>	<u>Count</u>	<u>Response</u>	<u>Lower Limit</u>
ICS and IBS.	124 124	400 Channel Analyzer (Gamma)	Scintillation	NaI	Gamma	10 min.	34 d/c/250 ml	2×10^{-11} Ci ¹³¹ I/250 ml
ICC, IBC, ARVVI, and ARCI.	124 124 157 161	400 Channel Analyzer (Gamma)	Scintillation	NaI	Gamma	10 min.	19 d/c/cartridge	9×10^{-11} Ci ¹³¹ I/ cartridge

Detection Qualifications

Assume uniform ¹³¹I discharge from the stack.

Assume 250 ml ICS of 7,000 ml sample in a 48 hour period.

Assume 250 ml IBS of 1,500 ml sample in a 48 hour period.

Assume 60 grams of charcoal in each ICC and IBC cartridge.

Assume the gamma spectrum is counted as ¹³¹I.

The lower limit of ¹³¹I is meaningful only if the sample count, after gamma isotopic correction, is greater than 10 counts per minute.

The lower limit will increase significantly in the presence of other isotopes depending on their relative energies and abundance.

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GASEOUS EFFLUENTS (Continued)

Sample Designation	Effluent Designation	Effluent	
		Lower Detection Limit*	Release Guide
ICS	291-A 1	9×10^{-4} Ci/week ¹³¹ I	3.0 Ci/week ¹³¹ I
IBS		2×10^{-4} Ci/week ¹³¹ I	"
ICC and IBC		2×10^{-5} Ci/week ¹³¹ I	"
ARVVI	296-A 12	2×10^{-4} Ci/week ¹³¹ I	1.5 Ci/week ¹³¹ I
ARCI	296-A 13	1×10^{-6} Ci/week ¹³¹ I	0.3 Ci/week ¹³¹ I

Sample Designation	Page	Counter	Detector		Detection		
			Type	Crystal	Sensitivity	Count	Response
Rack 73,	139	RMO Coincidence Counter (Alpha)	Scintillation	NE-102	Alpha and beta	3 min.	4.5 d/c Alpha
FSB,	124	RMO Coincidence Counter	Scintillation	NE-102	Alpha and beta	3 min.	4.5 d/c Alpha
E-7-4,	124						19.0 d/c Beta
E-1, 2, 3, 5,	127	(Alpha and Beta)					
6, and 7,	137						
BT-2, and	141						
E-10.	143						

Detection Qualifications

The alpha detector response is monitored with a ²³⁹Pu standard mounted on a stainless steel plate.

The beta detector response is monitored with a ⁹⁰Sr-Y standard mounted on a stainless steel plate.

*See "Detection Qualifications" on page 241.

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GASEOUS EFFLUENTS (Continued)
Detection Qualifications (Continued)

The alpha is calculated as ^{239}Pu .

The beta is calculated as $^{90}\text{Sr-Y}$.

The lower detection limits for the effluent systems are corrected for ^{90}Y .

The lower limit for alpha is meaningful only if the net sample count is greater than the background count.

The lower limit for beta is meaningful only if the net sample count is greater than one-third of the background count.

Sample Designation	Effluent Designation	Effluent System	
		Lower Detection Limit*	Release Guide
Rack 73	296-A 8	1.0×10^{-8} Ci/week ^{239}Pu	1×10^{-4} Ci/week Pu (total)
FSB	291-A 1	1.0×10^{-6} Ci/week ^{239}Pu 1.0×10^{-4} Ci/week ^{90}Sr	1×10^{-3} Ci/week Pu (total) 1×10^{-1} Ci/week ^{90}Sr
E-7-4		2.5×10^{-6} Ci/week ^{239}Pu 3.0×10^{-4} Ci/week ^{90}Sr	"
E-1	296-A 1	1.5×10^{-8} Ci/week ^{239}Pu 2.0×10^{-6} Ci/week ^{90}Sr	1×10^{-4} Ci/week Pu (total) 1×10^{-2} Ci/week ^{90}Sr
E-2	296-A 2	1.0×10^{-8} Ci/week ^{239}Pu 1.0×10^{-6} Ci/week ^{90}Sr	"

*See "Detection Qualifications" on pages 242 and 243.

GASEOUS EFFLUENTS (Continued)

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Sample Designation	Effluent Designation	Effluent System	
		Lower Detection Limit*	Release Guide
E-3	296-A 3	1.0 x 10 ⁻⁸ Ci/week ²³⁹ Pu 1.0 x 10 ⁻⁶ Ci/week ⁹⁰ Sr	1 x 10 ⁻⁴ Ci/week Pu (total) 1 x 10 ⁻² Ci/week ⁹⁰ Sr
E-5	296-A 5	4.5 x 10 ⁻⁸ Ci/week ²³⁹ Pu 5.0 x 10 ⁻⁷ Ci/week ⁹⁰ Sr	"
E-6	296-A 6	2.5 x 10 ⁻⁸ Ci/week ²³⁹ Pu 3.5 x 10 ⁻⁶ Ci/week ⁹⁰ Sr	"
E-7	296-A 7	4.0 x 10 ⁻⁸ Ci/week ²³⁹ Pu 5.0 x 10 ⁻⁶ Ci/week ⁹⁰ Sr	"
BT-2	296-A 10	2.0 x 10 ⁻⁸ Ci/week ²³⁹ Pu 2.5 x 10 ⁻⁶ Ci/week ⁹⁰ Sr	1 x 10 ⁻⁴ Ci/week Pu (total) 1 x 10 ⁻² Ci/week ⁹⁰ Sr
E-10	296-A 14	1.0 x 10 ⁻⁸ Ci/week ²³⁹ Pu 1.5 x 10 ⁻⁶ Ci/week ⁹⁰ Sr	"

Sample Designation	Page	Counter	Detector			Detection		
			Type	Sensitivity	Geometry	Count	Response	Lower Limit
Rack 73	139	Beta Proportional Counter (Beta)	Ionization	Beta and gamma	Second Shelf	5 min.	6.3 d/c Beta	3 x 10 ⁻¹¹ Ci Beta
AFS,	155							
ARVVS,	157							
ARCS,	161							
AXFS,	165							
BPS,	169							
SWS,	185							
WPS,	189							
CRV, and	191							
BYS-1, 2, and 3,	173 183	Beta Proportional Counter (Beta)	Ionization	Beta and gamma	Second Shelf	5 min.	5.7 d/c Beta	3 x 10 ⁻¹¹ Ci Beta

*See "Detection Qualifications" on pages 242 and 243.

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GASEOUS EFFLUENTS (Continued)

Detection Qualifications

The detector response is monitored with a ^{90}Sr -Y standard mounted on a filter paper.

The beta is calculated as ^{90}Sr -Y except for BYS-1, 2, and 3.

The beta for BYS-1, 2, and 3 is calculated as ^{137}Cs .

The lower detection limits for the effluent systems are corrected for ^{90}Y .

The lower limit is meaningful only if the net sample count is greater than one-fourth of the background count.

In addition, calibrations are made using several isotopes mounted on air filter paper and then counted under the same conditions as the samples.

<u>Sample Designation</u>	<u>Effluent Designation</u>	<u>Effluent System</u>	
		<u>Lower Detection Limit*</u>	<u>Release Guide</u>
Rack 73	296-A 8	1.0×10^{-6} Ci/week ^{90}Sr	1×10^{-2} Ci/week ^{90}Sr
AFS	296-A 11	2.5×10^{-8} Ci/week ^{90}Sr	"
ARVVS	296-A 12	3.5×10^{-9} Ci/week ^{90}Sr	5×10^{-2} Ci/week ^{90}Sr
ARCS	296-A 13	2.0×10^{-7} Ci/week ^{90}Sr	1×10^{-2} Ci/week ^{90}Sr

*See "Detection Qualifications" above.

GASEOUS EFFLUENTS (Continued)

<u>Sample Designation</u>	<u>Effluent Designation</u>	<u>Effluent System</u>	
		<u>Lower Detection Limit*</u>	<u>Release Guide</u>
AXFS	296-A 17	2.0×10^{-7} Ci/week ^{90}Sr	1×10^{-2} Ci/week ^{90}Sr
BPS	291-B 1	2.0×10^{-6} Ci/week ^{90}Sr	1×10^{-1} Ci/week ^{90}Sr
BYS-1	296-B 2	3.5×10^{-7} Ci/week ^{137}Cs	2×10^{-1} Ci/week ^{137}Cs
BYS-2	296-B 3	4.0×10^{-9} Ci/week ^{137}Cs	"
BYS-3	296-B 6	1.5×10^{-7} Ci/week ^{137}Cs	"
SWS	291-C 1	3.5×10^{-7} Ci/week ^{90}Sr	1×10^{-1} Ci/week ^{90}Sr
WPS	296-C 2	2.5×10^{-8} Ci/week ^{90}Sr	1×10^{-2} Ci/week ^{90}Sr
CRV	296-C 5	1.0×10^{-7} Ci/week ^{90}Sr	"

*See "Detection Qualifications" on page 245.

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REDOX ANALYTICAL LABORATORY
ANALYTICAL PROCEDURES FOR GASEOUS EFFLUENTS

<u>Sample Designation</u>	<u>Page</u>	<u>Counter*</u>	<u>Detector</u>			<u>Detection</u>		
			<u>Type</u>	<u>Sensitivity</u>	<u>Geometry</u>	<u>Count</u>	<u>Response</u>	<u>Lower Limit</u>
91-F	193	Beckman Wide Beta II (Alpha and Beta)	Ionization	Alpha and beta	Fixed Geometry	1 min.	3.4 d/c Alpha	2×10^{-12} Ci Alpha
X-1 and 2,	197						2.6 d/c Beta	1×10^{-11} Ci Beta
EF-3,	201							
PR-33,	203							
8-X,	205							
KX-3 and 4,	207							
Stack Breech,	219							
Alpha Monitor,	219							
CE-1,	209							
SX-1,	211							
219-S,	223							
291-T,	225							
Sec. 11, 15,	225							
and 20,	225							
EVP-1 and 2,	213							
TX-1,	217							
Location 1	229							
and 2,	229							
291-U,	231							
Sec. 5 and 19,	231							
X-31-1 and 2,	147							
X-13,	149							
F cell, and	153							
241-WR.	233							

*Gamma Energy Analysis (GEA) as required.

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GASEOUS EFFLUENTS (Continued)

Detection Qualifications

The alpha detector response is monitored with an ^{241}Am standard mounted on a stainless steel plate.

The beta detector response is monitored with ^{137}Cs , ^{151}Sm , and ^{90}Sr standards mounted on a stainless steel plate.

The alpha is calculated as ^{239}Pu .

The lower detection limits for the effluent systems are calculated as ^{90}Sr by multiplying the total beta count by an efficiency factor of 0.75.

The lower limit for alpha is meaningful only if the sample count is greater than one count per minute above the background count.

The lower limit for beta is meaningful only if the sample count is greater than twice the background count.

In addition, calibrations are made using several isotopes mounted on air filter paper and then counted under the same conditions as the samples.

<u>Sample Designation</u>	<u>Effluent Designation</u>	<u>Effluent System</u>	
		<u>Lower Detection Limit*</u>	<u>Release Guide</u>
S-1-F	291-S 1	4.0×10^{-7} Ci/week ^{239}Pu	1×10^{-3} Ci/week Pu (total)
		2.3×10^{-6} Ci/week ^{90}Sr	1×10^{-1} Ci/week ^{90}Sr
X-1	296-S 1	2.0×10^{-9} Ci/week ^{239}Pu	1×10^{-4} Ci/week Pu (total)
		8.0×10^{-9} Ci/week ^{90}Sr	1×10^{-2} Ci/week ^{90}Sr

*See "Detection Qualifications" above.

GASEOUS EFFLUENTS (Continued)

Sample Designation	Effluent Designation	Effluent System	
		Lower Detection Limit*	Release Guide
X-2	296-S 2	2.0 x 10 ⁻⁹ Ci/week ²³⁹ Pu 8.0 x 10 ⁻⁹ Ci/week ⁹⁰ Sr	1 x 10 ⁻⁴ Ci/week Pu (total) 1 x 10 ⁻² Ci/week ⁹⁰ Sr
EF-3	296-S 4	1.0 x 10 ⁻⁹ Ci/week ²³⁹ Pu 6.8 x 10 ⁻⁹ Ci/week ⁹⁰ Sr	"
PR-33	296-S 5	9.0 x 10 ⁻¹⁰ Ci/week ²³⁹ Pu 5.3 x 10 ⁻⁹ Ci/week ⁹⁰ Sr	"
8-X	296-S 6	5.0 x 10 ⁻⁹ Ci/week ²³⁹ Pu 3.0 x 10 ⁻⁸ Ci/week ⁹⁰ Sr	"
KX-3 and 4	296-S 7	4.0 x 10 ⁻⁹ Ci/week ²³⁹ Pu 2.3 x 10 ⁻⁸ Ci/week ⁹⁰ Sr	"
Stack Breech	296-S 13	3.0 x 10 ⁻⁷ Ci/week ²³⁹ Pu 1.5 x 10 ⁻⁷ Ci/week ⁹⁰ Sr	"
Alpha Monitor	296-S 13	5.0 x 10 ⁻⁸ Ci/week ²³⁹ Pu 3.0 x 10 ⁻⁷ Ci/week ⁹⁰ Sr	"
CE-1	296-S 14	9.0 x 10 ⁻¹⁰ Ci/week ²³⁹ Pu 5.3 x 10 ⁻⁹ Ci/week ⁹⁰ Sr	"
SX-1	296-S 15	2.0 x 10 ⁻⁹ Ci/week ²³⁹ Pu 1.5 x 10 ⁻⁸ Ci/week ⁹⁰ Sr	"
219-S	296-S 16	8.0 x 10 ⁻¹¹ Ci/week ²³⁹ Pu 4.5 x 10 ⁻¹⁰ Ci/week ⁹⁰ Sr	"

*See "Detection Qualifications" on page 248.

GASEOUS EFFLUENTS (Continued)

Sample Designation	Effluent Designation	Effluent System	
		Lower Detection Limit*	Release Guide
291-T	291-T 1	1.0 x 10 ⁻⁷ Ci/week ²³⁹ Pu 8.0 x 10 ⁻⁷ Ci/week ⁹⁰ Sr	1 x 10 ⁻³ Ci/week Pu (total) 1 x 10 ⁻¹ Ci/week ⁹⁰ Sr
EVP-1	296-T 1	3.0 x 10 ⁻⁹ Ci/week ²³⁹ Pu 1.5 x 10 ⁻⁸ Ci/week ⁹⁰ Sr	1 x 10 ⁻⁴ Ci/week Pu (total) 1 x 10 ⁻² Ci/week ⁹⁰ Sr
EVP-2	296-T 2	3.0 x 10 ⁻⁹ Ci/week ²³⁹ Pu 1.5 x 10 ⁻⁸ Ci/week ⁹⁰ Sr	"
TX-1	296-T 4	7.0 x 10 ⁻⁸ Ci/week ²³⁹ Pu 4.5 x 10 ⁻⁷ Ci/week ⁹⁰ Sr	"
291-U	291-U 1	1.0 x 10 ⁻⁷ Ci/week ²³⁹ Pu 5.3 x 10 ⁻⁷ Ci/week ⁹⁰ Sr	1 x 10 ⁻³ Ci/week Pu (total) 1 x 10 ⁻¹ Ci/week ⁹⁰ Sr
X-31-1 and 2	296-U 2	2.0 x 10 ⁻⁹ Ci/week ²³⁹ Pu 1.5 x 10 ⁻⁸ Ci/week ⁹⁰ Sr	1 x 10 ⁻⁴ Ci/week Pu (total) 1 x 10 ⁻² Ci/week ⁹⁰ Sr
X-13	296-U 3	3.0 x 10 ⁻⁹ Ci/week ²³⁹ Pu 1.5 x 10 ⁻⁸ Ci/week ⁹⁰ Sr	"
F Cell	296-U 5	2.0 x 10 ⁻⁹ Ci/week ²³⁹ Pu 1.5 x 10 ⁻⁸ Ci/week ⁹⁰ Sr	"
241-WR	296-U 6	5.0 x 10 ⁻⁹ Ci/week ²³⁹ Pu 3.0 x 10 ⁻⁸ Ci/week ⁹⁰ Sr	"

*See "Detection Qualifications" on page 248.

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PLUTONIUM FINISHING ANALYTICAL LABORATORY
ANALYTICAL PROCEDURES FOR GASEOUS EFFLUENTS

<u>Sample Designation</u>	<u>Page</u>	<u>Counter</u>	<u>Detector</u>			<u>Detection</u>		
			<u>Type</u>	<u>Crystal</u>	<u>Sensitivity</u>	<u>Count</u>	<u>Response</u>	<u>Lower Limit</u>
291-Z and 241-Z	235 239	Coincidence Counter (Alpha)	Scintillation	ZnS	Alpha	1 min.	20 d/m Alpha	2×10^{-6} Ci Alpha

Detection Qualifications

The sample filter paper is dry.

The detector response is monitored with a ^{239}Pu standard mounted on a stainless steel plate.

The alpha is calculated as all ^{239}Pu .

The lower limit is meaningful only if the sample count is greater than four counts per minute above the background count.

<u>Sample Designation</u>	<u>Effluent Designation</u>	<u>Lower Detection Limit*</u>	<u>Release Guide</u>
291-Z	291-Z 1	1×10^{-7} Ci/week ^{239}Pu	1×10^{-3} Ci/week Pu (total)
241-Z	296-Z 3	4×10^{-8} Ci/week ^{239}Pu	1×10^{-4} Ci/week Pu (total)

*See "Detection Qualifications".

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APPENDIX B

THE LIQUID EFFLUENT SYSTEMS
AND
THE ANALYTICAL PROCEDURES FOR THE LIQUID EFFLUENT SAMPLES

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LIQUID EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 6 Crib	Located 800 feet east of the 202-A Building.	Receives steam condensate from the 202-A Building.	63	H-2-3325 H-2-32521

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Continuous ($\sim 1.7 \times 10^6$ gal/mo.)	Estimated from the steam input to the 202-A Building.	Non-routine request

In-Line Monitoring and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
A-6	Sampler pit located 670 feet east of the 202-A Building.	Proportional sample	Seven-day period	Once per week	2000 ml	Two-month period

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<u>Designation</u>	<u>Page</u>
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LIQUID EFFLUENT SYSTEM

PUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawings</u>
216-A 10 Crib	Located 400 feet south of the 202-A Building	Receives process condensate from the 202-A Building	64	H-2-32521 H-2-57509

<u>Liquid effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Continuous ⁶ (~3.3 x 10 ⁶ gal/mo.)	Estimated from the flow sheet rates to the con- centrators	Non-routine request

In-Line Monitoring
and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
A-10	Sampler pit located 270 feet south of the 202-A Building	Dip sample	Weekly	Once per week	2,000 ml	Two-month period

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
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LIQUID EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 11 French Drain	Located 45 feet south of the 202-A Building.	Receives liquid waste from Trap Pit #1 at the east end of the 202-A Building.	65	H-2-55090

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None	None

LIQUID EFFLUENT SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 12 French Drain	Located 45 feet south of the 202-A Building.	Receives liquid waste from Trap Pit #3 near the center of the 202-A Building.	65	H-2-55092

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None	None

LIQUID EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 15 French Drain	Located 100 feet east of the 202-A Building 216-A 5 process condensate sampler pit.	Receives process condensate overflow from the A5 Catch Tank proportional sampler.	65	H-2-56045

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None	None

LIQUID EFFLUENT SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 16 French Drain	Located northwest of the 431 Con- denser Building in the 241-A Tank Farm.	Receives floor drain waste from the 431 Building and condensate from the 296-A 11 Stack.	65	H-2-55943

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None	None

LIQUID EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 17 French Drain	Located northwest of the 431 Condenser Building in the 241-A Tank Farm.	Receives the overflow from the 216-A 16 French Drain.	65	H-2-55943

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None	None

LIQUID EFFLUENT SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 22 French Drain	Located 22 feet north of the Tank-P1 basin outside the retaining wall of the 203-A Storage Area.	Receives waste from the sump on the UNH truck loading apron in the 203-A Storage Area.	66	H-2-54818

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Drawing</u>
As required	None	None	None	None	None

LIQUID EFFLUENT SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 23A&B French Drain	Located 10 feet from the south wall of the 431 Condenser Building in the 241-A Tank Farm.	Receives 241-A and AX Tank Farm deentrainment and back flush waste from the 433-A Tank in the 431 Building.	66	H-2-56999

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None

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LIQUID EFFLUENT SYSTEM

PUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 27 Crib	Location 700 feet south of the 202-A Building.	Receives 202-A Analytical Laboratory waste and liquid waste from the 291-A Area.	67	H-2-32521 H-2-57509

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Batch (~1.2 x 10 ⁴ gal/mo.)	Waste tank volume	---

In-Line Monitoring and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>	
		<u>Type</u>	<u>Collected</u>
U3 and U4	Waste receiver tanks U3 and U4 located in the 202-A Building.	Tank sample	3000 gallon batch
A-27	Riser located at the 216-A 27 Crib.	Dip sample	Weekly

<u>Liquid Sample</u>		
<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
Every batch	20 ml	None
Once per week	2000 ml	Two-month period

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
U3 and U4	337
A-27	337

--- Not applicable

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LIQUID EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 30 Crib	Located 2,000 feet east of the 202-A Building.	Receives steam condensate from the 202-A Building and miscellaneous liquid waste from the 202-A Equipment Disposal Tunnel.	68	H-2-32521 H-2-57720

In-Line Monitoring and Alarm System

None

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>
Continuous (~4.9 X 10 gal/mo.)	Estimated from the steam input to the 202-A Building.	Non-routine request

SAMPLING

<u>Pulled</u>	<u>Liquid Sample Volume</u>	<u>Composited</u>
Once per week	2000 ml	Two-month period

<u>Location</u>	<u>Type</u>	<u>Sampling Collected</u>
Sampler pit located 670 feet east of the 202-A Building.	Proportional sample	Seven-day period

<u>Designation</u>
A-30

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
A-30	337

LIQUID EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 31 Crib	Located 450 feet south of the 202-A Building.	Receives occasional process organic waste from the 202-A Building.	69	H-2-32521 H-2-57934

<u>Liquid Effluent</u>			<u>In-Line Monitoring and Alarm System</u>
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	
As required	Waste tank volume	---	None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
A-31	Waste receiver tanks F13, G5, G7, R5, and R7 located in the 202-A Building.	Tank sample	As required	As required	As required	As required

ANALYTICAL PROCEDURE

A-31 (As required)

--- Not applicable

LIQUID EFFLUENT SYSTEMPUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 36B Crib	Located 725 feet south of the center of the 202-A Building.	Receives ammonia scrubber waste from the 202-A Building.	70	R-2-59805

In-Line Monitoring and Alarm System

None

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>
Batch (~2.5 X 10 ⁵ gal/mo.)	Waste tank volume	---

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling Type</u>	<u>Collected</u>	<u>Liquid Sample Pulled</u>	<u>Volume</u>	<u>Composited</u>
A-36	Sampler located in the 295-A Building.	Proportional sample	Daily*	Once per week	100 ml	Two-month period

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
A-36	337

--- Not applicable

* In addition, a proportional sample is taken any time ammonia scrubber catch tank waste is jetted to the A-36B Crib.

LIQUID EFFLUENT SYSTEM

PUREX SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-U 12 Crib	Located 1,700 feet south of the 224-U Building.	Receives process condensate from the 224-U Building.	71	H-2-31321 H-2-32527

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Batch 5 (~2.1 X 10 gal/mo.)	Waste tank volume	---

In-Line Monitoring
and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
C-5	Condensate receiver tank C-5 located in the 224-U Building.	Proportional sample	Seven-day period	Once per week	1000 ml	One-month period

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
C-5	341

---Not applicable

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LIQUID EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 8 Crib	Located 500 feet east of the 241-AX Tank Farm	Receives condensate from waste storage tanks in the 241-A and AX Tank Farms.	73	H-2-32521 H-2-56157

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Continuous; (~5.2 X 10 gal/mo.)	Fill rate of receiver tank.	Daily

In-Line Monitoring
and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
A08	Condensate receiver tank 241- A-417 located south of the AX Tank Farm.	Tank sample	Every shift	Once per shift	400 ml	One-month period (A8C) by PNL

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
A08	343

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LIQUID EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 24 Crib	Located 500 feet east of the 241-AX Tank Farm.	Serves as a backup to the 216-A 8 Crib, receiving condensate from waste storage tanks in the 241-A and AX Tank Farms.	74	H-2-32521 H-2-56977

<u>Liquid Effluent</u>			<u>In-Line Monitoring and Alarm System</u>
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	
As required	Flow recorder	As required	None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
A08	Condensate receiver tank 241-A-417 located south of the AX Tank Farm.	Tank sample	As required	As required	As required	As required by PNL

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
A08	343

LIQUID EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawings</u>
216-A 25 Swamp	Located one mile north of the 200 East Area.	Receives cooling water from the 202-A Building, condenser cooling water from the 431 Building in the 241-A Tank Farm, cooling water and steam condensate from the 244-AR Vault, and waste water from the 284-E Power House.	75	H-2-3325 H-2-32521

<u>Facility</u>	<u>Liquid Effluent to Swamp</u>			<u>In-Line Monitoring and Alarm System</u>
	<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	
202-A Building	Continuous ($\sim 1.6 \times 10^8$ gal/mo.)	Estimated from the raw water input to the building.	Non-routine request	None
241-A Tank Farm	Continuous ($\sim 3.3 \times 10^7$ gal/mo.)	Estimated from the total volume to the A-25 Swamp.	Non-routine request	None
244-AR Vault	Continuous ($\sim 5.3 \times 10^6$ gal/mo.)	Estimated from the total volume to the A-25 Swamp.	Non-routine request	Yes
284-E Power House	Continuous ($\sim 4.7 \times 10^7$ gal/mo.)	Estimated from the steam production.	Non-routine request.	None
Total effluent to 216-A 25 Swamp	Continuous ($\sim 245.3 \times 10^6$ gal/mo.)	Flow recorder.	Weekly	None

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216-A 25 (continued)

SAMPLING

<u>Designation</u>	<u>Effluent</u>	<u>Location</u>	<u>Sampling</u>	
			<u>Type</u>	<u>Collected</u>
Pump Pit	202-A cooling water.	241-A-201 Pump Pit located 400 feet southeast of the 202-A Building.	Proportional sample	Seven-day period
CA8	241-A and AX cooling water from the 201-A Tank.	Hot pit located at the east entrance from Canton Avenue to the 241-A and AX Tank Farm.	Dip sample	Weekly
CAR	244-AR cooling water and steam condensate.	Manhole located on the north side of the AR Vault.	Dip sample	Weekly
Swamp Inlet	---	Inlet line to the 216-A 25 Swamp.	Dip sample	Weekly
Swamp North	---	North end of the 216-A 25 Swamp	Dip sample	Weekly

ANALYTICAL PROCEDURE

	<u>Liquid Sample</u>			<u>Designation</u>	<u>Page</u>
	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>		
Pump Pit	Once per week	1,000 ml	Two month period	Pump Pit	337
CA8	Once per week	400 ml	One-month period (CAC) by PNL	CA8	343
CAR	Once per week	400 ml	One-month period (ARC) by PNL	CAR	343
Swamp Inlet	Once per week	100 ml	None	Swamp Inlet	341
Swamp North	Once per week	100 ml	None	Swamp North	341

--- Not applicable

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216-A 25 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Location</u>	<u>Detector</u> <u>Type</u>	<u>Crystal</u>	<u>Sensitivity</u>
Cooling water and steam condensate from the 244-AR Vault.	Gamma continuous monitor	Located underground at the effluent line on the north side of the AR Vault.	Scintillation	NaI	Gamma
	<u>Instrumentation</u>	<u>Recorder</u>	<u>Location</u> <u>Instrumentation & Recorder</u>		
	Log-scaled count rate meter	Log-scaled	Located in the control room of the AR Vault.		

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Isotope</u>	<u>Calibration</u> <u>Lower Detection Limit</u>
Cooling water and steam condensate from the 244-AR Vault.	Located in the control room of the AR Vault.	Audio and visual	Manual	¹³⁷ Cs-Ba	40 x 10 ⁻⁵ uCi/ml
	<u>Release Guide</u>				
	5 x 10 ⁻⁵ uCi/ml mixed fission products.				

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LIQUID EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 25 French Drain	Located 80 feet south of the 291-A Fan Control House.	Receives liquid waste from the two floor drains in the 291-A Fan Con- trol House.	76	H-2-3325

<u>Discharge</u>	<u>Liquid Effluent</u>		<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
	<u>Measurement</u>	<u>Rate Check</u>			
As required	None	None	None	None	None

LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 29	The head end of the ditch is located 300 feet east of the 200 East Area fence and south of the 241-A Tank Farm. It extends 2,000 feet to the east and then 3,000 feet to the north joining the 216-B 2 Ditch. From this junction, the ditch extends 1,500 feet to the east emptying into the 216-B 3 Swamp.	Receives chemical sewer waste from the 202-A Building.	77	H-2-32521

<u>Liquid Effluent to Ditch</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Continuous (1.4 X 10 gal/mo.)	Estimated from the raw water and steam input to the 202-A Building, and the flow sheet rates to chemical flush tanks.	Non-routine request.

In-Line Monitoring and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
Chemical Sewer	Inlet line to the end of the 216-A 29 Ditch.	Proportional Sampler	Seven-day period	Once per week	400 ml	Two-month period

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
Chemical Sewer	338

LIQUID EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 39 Ditch	Located 200 feet northwest of the 244-AR Vault.	Receives diverted cooling water and steam condensate from the 244-AR Vault.	78	H-2-44500

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
As required	Estimated from the volume to the A-25 Swamp.	None

In-Line Monitoring
an Alarm System

216-A 25 (see page 236)

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
A-39	216-A 39 Ditch	Dip sample	As required	As required	As required	As required

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
A-39	343

LIQUID EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-A 40 Crib	Located 50 feet north of the 241-AX Tank Farm.	Receives floor drain waste from the 706-B Building in the 241-AX Tank Farm.	79	H-2-33295

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None	None

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LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-B 2 Ditch	The head end of the ditch is located 500 feet southeast of the 241-B Tank Farm. It extends 3,500 feet to the southeast entering a 1,500 foot, 24 inch underground pipe and emerges again into an open ditch. The ditch then extends 2,000 feet to the east joining the 216-A 29 Ditch. From this junction, the ditch extends 1,500 feet to the east emptying into the 216-B 3 Swamp.	Receives cooling water, occasional steam condensate, and chemical sewer waste from the 221-B Building, cooling water from the ITS #1&2 facilities in the 241-BY Tank Farm and the CR Vault, and chemical sewer waste from the 216-A 29 Ditch.	80	H-2-2431 H-2-32522

<u>Facility</u>	<u>Liquid Effluent to Ditch</u>			<u>In-Line Monitoring and Alarm System</u>
	<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	
221-B Cooling water and steam condensate	Continuous (~1.9 X 10 ⁶ gal/mo.)	Estimated from the volume to the retention basin.	---	Yes
221-B Chemical sewer waste	Continuous (~1.2 X 10 ⁷ gal/mo.)	Estimated from the effluent line flow rate.	Non-routine request	None
ITS Facilities	Continuous (Not available)	None	Non-routine request	None
241-CR Vault	Continuous (~5.0 X 10 ⁷ gal/mo.)	Estimated from the effluent line flow rate.	Non-routine request	Yes

--- Not applicable

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216-B (continued)

SAMPLING

<u>Designation</u>	<u>Effluent</u>	<u>Location</u>	<u>Type</u>	<u>Sampling</u> <u>Collected</u>
CSP and CNP	221-B cooling water and steam condensate	207-B Retention Basin	Dip sample	500,000 gallon batch
BCE	221-B Chemical sewer waste	Manhole to effluent line north of the 221-B Building.	Dip sample	Weekly
CTS	ITS #1 cooling water	Inlet line to the head end of the 216-B 2 Ditch.	Dip sample	Weekly
C2S	ITS #2 cooling water	Inlet line to the head end of the 216-B 2 Ditch.	Dip sample	Weekly
CCR	241-CR Vault cooling water	Sampler pit at the west side of the 241-CR Vault.	Dip sample	Weekly
B and C Farm Water	CSP, CNP, CTS, C2S cooling water, and CCR	Inlet to the 24 inch underground pipe in the 216-B 2 Ditch north of the CR Vault.	Dip sample	Weekly

ANALYTICAL PROCEDURE

	<u>Liquid Sample</u>			<u>Designation</u>	<u>Page</u>
	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>		
CSP and CNP	Every batch	100 ml	One-month (CBC) period by PNL	CSP	341
				CNP	341
BCE	Once per week	100 ml	One-month period by PNL	BCE	343
CTS	Once per week	100 ml	One-month period (CTC) by PNL	CTS	343
C2S	Once per week	100 ml	One-month period (C2M) by PNL	C2S	343
CCR	Once per week	250 ml	One-month period (CCC) by PNL	CCR	341
B and C Farm Water	Once per week	100 ml	None	B and C Farm Water	341

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216-B 2 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Detector</u>			
		<u>Location</u>	<u>Type</u>	<u>Crystal</u>	<u>Sensitivity</u>
Cooling water and steam condensate from the 221-B Building (15 inch header).	Gamma continuous monitor	Located in the 221-BA Building south of the east end of the 221-B Building.	Scintillation	NaI	Gamma
Cooling water from the 221-B Building (24 inch header).	Gamma continuous monitor	Located underground at the effluent line on the southeast side (R-1) at the 221-B Building.	Ionization	---	Gamma
Cooling water from the 241-CR Vault.	Gamma continuous monitor	Located between the effluent lines in the sampler pit on the west side of the 241-CR Vault.	Ionization	---	Gamma

	<u>Instrumentation</u>	<u>Recorder</u>	<u>Location Instrumentation</u>	<u>Location Recorder</u>
(15 inch header)	Linear count rate meter	Linear scaled	Located in the shift supervisors office in the 271-B Building.	Located in the shift supervisors office in the 271-B Building.
(24 inch header)	Linear count rate meter	Linear scaled	Located in the shift supervisors office in the 271-B Building.	Located in the shift supervisors office in the 271-B Building.
241-CR Vault	Linear count rate meter	Linear scaled	Located in the 002-CR shack over the CR Vault.	Located in the control room of the 271-CR Building.

--- Not applicable

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216-B ? (continued)

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Calibration</u>		
			<u>Reset</u>	<u>Isotope</u>	<u>Lower Detection Limit</u>
(15 inch header).	Located in the shift supervisors office in 271-B Building.	Audio and visual	Manual	$^{137}\text{Cs-Ba}$	1×10^{-5} uCi/ml
(24 inch header).	Located in the shift supervisors office in the 271-B Building.	Audio	Manual	---	Has not been calibrated. (Source checks, bugging, etc. cannot be construed to be calibrations.)
241-CR Vault	Located in the control room of the 271-CR Building and the dispatcher office at the 271-B Building.	Audio and visual	Manual	---	Has not been calibrated. (Source checks, bugging, etc. cannot be construed to be calibrations.)
<u>Release Guide</u>					
5×10^{-5} uCi/ml mixed fission products					

--- Not applicable

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LIQUID EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-B 3 Swamp	Located one mile east of the 241-C Tank Farm.	Receives liquid waste from the 216-A 29 and 216-B 2 Ditches.	81	H-2-2431 H-2-32522
<u>Liquid Effluent to Ditch</u>				
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	<u>In-Line Monitoring and Alarm System</u>	
Continuous *(6.6×10^7 gal/mo.)	Estimated from the total volume to the A-29 and B-2 Ditches.	Non-routine request	None	

SAMPLING

<u>Designation</u>	<u>Effluent</u>	<u>Location</u>	<u>Sampling</u>	
			<u>Type</u>	<u>Collected</u>
Ditch Inlet	216-B 2 Ditch	Inlet line to the 216-B 3 Swamp.	Dip sample	Weekly
Swamp North	---	North end of the 216-B 3 Swamp.	Dip sample	Weekly
<u>Liquid Sample</u>				
	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>	
Ditch Inlet	Once per week	100 ml	None	
Swamp North	Once per week	100 ml	None	

ANALYTICAL PROCEDURE

* Excluding ITS Facilities
--- Not applicable

<u>Designation</u>	<u>Page</u>
Ditch Inlet	341
Swamp North	341

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LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawings</u>
216-B 12 Crib	Located 1,000 feet northwest of the 221-B Building.	Receives process condensate from the 221-B Building.	82	H-2-32522 H-2-43029

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Continuous ($\sim 3.3 \times 10^5$ gal/mo.)	Estimated from the con- centrator input and out- put volume.	Non-routine request

In-Line Monitoring
and Alarm System

Yes

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
BCP	Process condensate receiver tank located in the 221-B Building.	Tank dip sample	Every shift	Once per shift	100 ml	One-week and one-month periods by PNL

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
BCP	341

216-B 12 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Detector</u>		
		<u>Location</u>	<u>Type</u>	<u>Sensitivity</u>
Process condensate from the 221-B Building	Beta-gamma continuous monitor	Located in the 221-B Building at the process condensate receiver tank.	Ionization	Beta and gamma
	<u>Instrumentation</u>	<u>Recorder</u>	<u>Location</u>	
			<u>Instrumentation</u>	<u>Recorder</u>
	Linear and log-scaled count rate meter.	Linear or log-scaled	Located in the shift supervisor's office in the 271-B Building.	

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Calibration</u>	
				<u>Isotope</u>	<u>Lower Detection Limit</u>
Process condensate from the 221-B Building.	Located in the shift supervisor's office in the 271-B Building.	Audio and visual	Manual	⁹⁰ Sr	1 x 10 ⁻⁴ µCi/ml*
<u>Release Guide</u>					
5 x 10 ⁻⁵ to 100 µCi/ml mixed fission products					

* Assume 2000 c/m background at the monitor.

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LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-B 13 French Drain	Located 25 feet north of the 291-B 1 Stack.	Receives liquid waste from the 291-B 1 Stack drain.	83	H-2-2926

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None	None

LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawings</u>
216-B 50 Crib	Located 300 feet north of the 241-BY Tank Farm.	Receives waste storage tank condensate from ITS #1 operations in the 241-BY Tank Farm.	84	H-2-2603 H-2-32522

<u>Liquid Effluent</u>			<u>In-Line Monitoring and Alarm System</u>
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	
Continuous ($\sim 1.5 \times 10^5$ gal/mo.)	Estimated from the red- uction of waste storage tank volume.	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
ITS	Sample box located at the ITS #1 Unit in the 241-BY Tank Farm.	Continuous sampling	One-day period	Once per week	250 ml	One-month period (ITM) by PNL

ANALYTICAL PROCEDURE

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ITS	343

LIQUID EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-B 55 Crib	Located 600 feet west of the 221-B Building.	Receives steam condensate from the concentrators in the 221-B Building.	85	SK-2-19674 H-2-32522

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>
Continuous ($\sim 6.6 \times 10^5$ gal/mo.)	Estimated from the steam input to the concentrators.	Non-routine request

In-Line Monitoring and Alarm System

Yes

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
BCS	Steam condensate receiver tank located in the 216-B Building.	Tank dip sample	Every shift	Once per shift	100 ml	One-week and one-month periods by PNL

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
BCS	341

216-B 55 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Location</u>	<u>Detector</u> <u>Type</u>	<u>Sensitivity</u>
Steam condensate from the 221-B Building.	Beta-gamma continuous monitor	Located in the 216-B Building at the steam condensate receiver tank.	Ionization	Beta and gamma
	<u>Instrumentation</u>	<u>Recorder</u>	<u>Location</u> <u>Instrumentation and Recorder</u>	
	Linear and log-scaled count rate meter.	Linear or log-scaled	Located in the shift supervisor's office in the 271-B Building.	

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Calibration</u>	
Steam condensate from the 221-B Building.	Located in the shift supervisor's office in the 271-B Building.	Audio	Manual	<u>Isotope</u> 90Sr	<u>Lower Detection Limit</u> 1 x 10 ⁻⁴ µCi/ml*
	<u>Release Guide</u>				
	5 x 10 ⁻⁵ to 100 µCi/ml mixed fission products				

* Assume 2000 c/m background at the monitor.

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LIQUID EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-B 57 Crib	Located 75 feet west of the north end of the 241-BY Tank Farm.	Receives waste storage tank condensate from ITS #2 operations in the 241-BY Tank Farm.	86	H-2-62406

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Continuous (4.7×10^5 gal/mo.)	Estimated from the reduction of waste storage tank volume.	Non-routine request

In-Line Monitoring and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
2TS	Sample box located at the ITS #2 Unit in the 241-BY Tank Farm.	Continuous sampling	One-day period	Once per day	250 ml	One-month period (2TM) by PNL

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
2TS	343

LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-B 58 Ditch	Located 800 feet northeast of the 221-B Building.	Receives diverted cooling water and steam condensate from the 221-B Building (15 inch header).	87	H-2-60310

<u>Discharge</u>	<u>Liquid Effluent</u>		<u>In-Line Monitoring and Alarm System</u>
	<u>Measurement</u>	<u>Rate Check</u>	
As required	Estimated from the volume to the retention basin.	None	216-B 2 (see page 247)

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
B-58	216-B 59 Ditch	Dip sample	As required	As required	As required	As required

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
B-58	343

LIQUID EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawings</u>
216-B 61 Crib	Located 600 feet northwest of the 241-BY Tank Farm.	Serve as a backup to the 216-B 50 Crib. (Not used)	88	H-2-34522 H-2-34523

In-Line Monitoring
and Alarm System

None

LIQUID EFFLUENT
Measurement

<u>Discharge</u>	<u>Rate Check</u>
As required	As required

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Liquid Sample</u>		
		<u>Type</u>	<u>Sampling Collected</u>	<u>Pulled Volume Composited</u>
ITS	Sample box located at the ITS #1 Unit in the 241-BY Tank Farm.	Proportional sample	As required	As required As required by PNL

ANALYTICAL PROCEDURE

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ITS	343

LIQUID EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-C 2 Dry Well	Located 50 feet southeast of the 291-C 1 Stack.	Receives liquid waste from the 291-C 1 Stack Drain.	89	H-2-4033 H-2-32523

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None	None

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LIQUID EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-C 7 Crib	Located 75 feet south of the 209-E Building.	Receives waste water from PNL operations in the 209-E Building.	90	H-2-32523 H-2-44336

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Batch (~10 gal/mo.)	Waste tank volume	---

In-Line Monitoring
and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
PNL	Hold-up tank located in the 209-E Building.	Tank sample	50 gallon batch	Every batch	30 ml	None

ANALYTICAL PROCEDURE

PNL

--- Not applicable

LIQUID EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-C 8 French Drain	Located 300 feet east of the 271- CR Building.	Receives floor drain waste from the 271-CR Building.	91	H-2-32523

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None	None

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LIQUID EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-C 9 Swamp	Located 400 feet north of the 271-C Building.	Receives cooling water, steam condensate, and waste water from floor drains in the 201-C Building, and waste water from PNL operations in the 209-E Building.	92	H-2-4010 H-2-32523

<u>Facility</u>	<u>Liquid Effluent to Swamp</u>			<u>In-Line Monitoring and Alarm System</u>
	<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	
201-C Building	Continuous ($\sim 3.2 \times 10^5$ gal/mo.)	None	Non-routine request	Yes
209-E Building	Continuous (~ 200 gal/mo.)	None	Non-routine request	None

216-C 9 (continued)

SAMPLING

<u>Designation</u>	<u>Effluent</u>	<u>Location</u>	<u>Type</u>	<u>Sampling</u> <u>Collected</u>
CSW	201-C cooling water and steam condensate.	Inlet line to the 216-C 9 Swamp.	Dip sample	Weekly
Hot Semiworks Swamp	---	South side of the 216-C 9 Swamp.	Dip sample	Weekly

ANALYTICAL PROCEDURE

	<u>Liquid Sample</u>			<u>Designation</u>	<u>Page</u>
	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>		
CSW	Once per week	250 ml	One-month period (CSC) by PNL	CSW	343
Hot Semiworks Swamp	Once per week	250 ml	None	Hot Semiworks	341

--- Not applicable

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216-C 9 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Location</u>	<u>Detector Type</u>	<u>Sensitivity</u>
Cooling water and steam condensate from E Cell tank coils in the 201-C Building.	Gamma continuous monitor	Located at the effluent line in the E Cell of the 201-C Building.	Ionization	Gamma
Cooling water and steam condensate from the 201-C Building.	Gamma continuous monitor	Located underground at the effluent line on the east side of the 201-C Building.	Ionization	Gamma
	<u>Instrumentation</u>	<u>Recorder</u>	<u>Location Instrumentation</u>	
E Cell tank coils	Linear count rate meter	None	Located in the 291-C Building.	
201-C Building	Linear count rate meter	None	Located in the control room in the 201-C Building.	

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Calibration</u>
Cooling water and steam condensate from E Cell tank coils in the 201-C Building.	Located in the control room of the 201-C Building and the dispatchers office in the 271-B Building.	Audio and visual	Manual	Has not been calibrated. (Source checks, bugging, etc. cannot be construed to be calibrations.)
Cooling water and steam condensate from the 201-C Building.	Located in the control room of the 201-C Building and the dispatchers office in the 271-B Building.	Audio and visual	Manual	Has not been calibrated. (Source checks, bugging, etc. cannot be construed to be calibrations.)

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LIQUID EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawings</u>
216-S 6 Crib	Located 3,400 feet southwest of the 202-S Building.	Receives steam condensate from the 202-S Building.	93	H-2-2594 H-2-32525

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Continuous; (~8.5 X 10 gal/mo.)	Flow recorder	Non-routine request

<u>In-Line Monitoring and Alarm System</u>
Yes

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
S-6	Cascade weir located on the north side of the 216-S 6 Crib.	Dip sample	Weekly	Once per week	250 ml	One-month period by PNL

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
S-6	343

LIQUID EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-S 9 [*] Crib	Located 1,000 feet east of the 241-S Tank Farm.	Receives process condensate from the 202-A Building.	94	H-2-32363 H-2-32525

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Batch ($\sim 2.9 \times 10^5$ gal/mo.)	Waste tank volume	---

In-Line Monitoring and Alarm System

None

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
S-9	Waste receiver tank D-2 located in the 202-S Building.	Tank sample	5000 gallon batch	Every batch	250 ml	One-month period by PNL

^{*} Removed from service as of January 1, 1969.
Replaced by the 216-S 23 Crib.

ANALYTICAL PROCEDURE

--- Not applicable

<u>Designation</u>	<u>Page</u>
S-9	343

LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-S 10 Ditch	The head end of the ditch is located 400 feet southwest of the 207-S Retention Basin and extends 2,800 feet in a southwesterly direction emptying into the 216-S 11 Swamp.	Receives chemical sewer waste from the 202-S Building.	95	H-2-5962 H-2-32525

<u>Liquid Effluent to Ditch</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Continuous (4.0×10^3 gal/mo.)	Estimated from flow through effluent line.	Non-routine request

In-Line Monitoring and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
S-11	Inlet line to the head of the 216-S 10 Ditch.	Dip Sample	Weekly	Once per week	250 ml	One-month period by PNL

ANALYTICAL PROCEDURE

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LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-S 11 Swamp	Located 3,600 feet southwest of the 202-S Building.	Receives liquid waste from the 216-S 10 Ditch.	96	H-2-2430 H-2-5962 H-2-32525
<u>Liquid Effluent to Swamp</u>				
	<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>
	Continuous (~4.0 X 10 ³ gal/mo.)	Estimated from volume to S-10 Ditch.	Non-routine request	None
				<u>In-Line Monitoring and Alarm System</u>
				None

LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

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<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-S 16 Swamp	Located a mile and a half south- west of the 202-S Building.	Receives liquid waste from the 216-S 24 Ditch.	97	H-2-30264 H-2-32525

<u>Liquid Effluent to Swamp</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Continuous; (~2.3 X 10 gal/mo.)	Estimated from volume to S-24 Ditch.	Non-routine request

In-Line Monitoring
and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
Pond 1	East side of the 216-S 16 Swamp in Pond #1.	Dip Sample	Weekly	Once per week	100 ml	None

ANALYTICAL PROCEDURE

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Pond 1	343

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LIQUID EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-S 19 Swamp	Located 2,000 feet south of the 222-S Building.	Receives ventilation cooling water and waste water from the 222-S Building	98	H-2-5101 H-2-32525

<u>Liquid Effluent</u>			<u>In-Line Monitoring and Alarm System</u>
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	
Continuous (~7.5 X 10 ⁵ gal/mo.)	Batch	---	None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
S-19	222-S Retention Basin.	Dip sample	25,000 gallon batch	Every batch	30 ml	One-month period by PNL
222-S Swamp	Northwest of the inlet pipe to the 216-S 19 Swamp.	Dip sample	Weekly	Once per week	100 ml	None

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
S-19	343
222-S Swamp	341

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--- Not applicable

LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-S 21 Crib	Located 400 feet west of the 241-S Tank Farm.	Receives condensate from waste storage tanks in the 241-SX Tank Farm.	99	H-2-32525 H-2-39549

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>
As required	Flow recorder	Monthly

In-Line Monitoring
and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
S-21	Condensate return header tank in the 401 Building located in the SX Tank Farm.	Tank Sample	Weekly	Once per week	250 ml	One-month period by PNL

ANALYTICAL PROCEDURE

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S-21	343

LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-S 23* Crib	Located 1,000 feet northeast of the 241-S Tank Farm.	Receives process condensate from the 202-S Building.	100	H-2-46111

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Batch 5 (~2.9 X 10 gal/mo.)	Waste tank volume	---

In-Line Monitoring
and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
S-23	Waste receiver tank D-2 located in the 202-S Building.	Tank Sample	5000 gallon batch	Every batch	250 ml	One-month period by PNL

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
S-23	343

- Replaces the 216-S 9 Crib.
- Not applicable

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LIQUID EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-S 24 Ditch	The head end of the ditch is located 1,600 feet west of the 216-S 6 Crib. It extends 600 feet to the west and then 1,600 feet to the southwest emptying into the 216-S 16 Swamp.	Receives concentrator cooling water from the 202-S Building.	101	H-2-3254 H-2-3255

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Continuous, (~2.3 X 10 gal/mo.)	Flow meter	Non-routine request

In-Line Monitoring
and Alarm System

Yes

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
S-16	Southwest corner of the 202-S Building in the 211 Tank Farm.	Continuous sample	Weekly	Once per week	250 ml	One-month period by PNL

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
S-16	343

216-S 24 (continued)

IN-LINE MONITORING

<u>Designation</u>	<u>Monitor</u>	<u>Location</u>	<u>Detector Type</u>	<u>Sensitivity</u>
Concentrator cooling water and steam condensate from the 202-S Building.	Gamma continuous monitor	Located at the effluent line in the storage gallery of the 202-S Building.	Ionization	Gamma
	<u>Instrumentation</u>	<u>Recorder</u>	<u>Location Instrumentation</u>	<u>Location Recorder</u>
	Linear count rate meter	Linear scaled	Located in the north operating gallery in 202-S Building.	Located in the dispatchers office in the 202-S Building.

ALARM SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Response</u>	<u>Reset</u>	<u>Calibration</u>
Concentrator cooling water and steam condensate from the 202-S Building.	Located in the dispatchers office in the 202-S Building.	Audio and visual	Manual	Has not been calibrated. (Source checks, bugging, etc., cannot be construed to be calibrations.)

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LIQUID EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-T 1 Ditch	The head end of the ditch is located 200 feet north of the 221-T Building and extends 1,000 feet in a north-westerly direction.	Receives liquid waste from PNL operations in the 221-T Building.	102	H-2-5101 H-2-32526

<u>Liquid Effluent to Ditch</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
As required	Containment vessel volume	None

In-Line Monitoring
and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
PNL	Primary containment vessel in the 221-T Building.	Tank sample	Each containment vessel run	Each run	500 ml	None
	Inlet line to the concrete apron at the head end of the 216-T 1 Ditch.	Dip sample	Each containment vessel run	Each run	1,000 ml	None
		Mud sample	Each containment vessel run	Each run	250 ml	None
216-T 1 Ditch		Dip sample	Each containment vessel run	Each run	1,000 ml	None
		Mud sample	Each containment vessel run	Each run	250 ml	None

ANALYTICAL PROCEDURE

PNL

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LIQUID EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

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<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-T 4 Swamp	Located directly north of the 241-T Tank Farm.	Receives cooling water from the 242-T and the 271-T Buildings, steam condensate from the 221-T Building, and decontamination waste from the 2706-W Building.	103	H-2-2430 H-2-32526

<u>Facility</u>	<u>Liquid Effluent to Swamp</u>			<u>In-Line Monitoring and Alarm System</u>
	<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	
221-T Building	Continuous (~8.4 X 10 ⁴ gal/mo.)	None	Non-routine request.	None
242-T Building	Continuous (~7.7 X 10 ⁶ gal/mo.)	Estimated by volume to retention basin.	Non-routine request.	None
2706-W Building	Continuous (~6.0 X 10 ⁴ gal/mo.)	None	Non-routine request.	None

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SAMPLING

<u>Designation</u>	<u>Effluent</u>	<u>Location</u>	<u>Sampling</u>	
			<u>Type</u>	<u>Collected</u>
C4N and C4S	242-T cooling water, and decontamination waste from the 2706-W Building.	207-T Retention Basin	Dip sample	500,000 gallon batch
T-Plant Swamp	---	Inlet line to the 216-T 4 Swamp from the 207-T Retention Basin	Dip sample	Weekly

--- Not applicable

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216-T 4 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Liquid Sample</u>		<u>Composited</u>
	<u>Pulled</u>	<u>Volume</u>	
C4N and C4S	Every batch	250 ml	One-month period (C4C) by PNL
T-Plant Swamp	Once per week	100 ml	None

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
C4N	343
C4S	343
T-Plant Swamp	341

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LIQUID EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-T 19 Crib and Tile Field	Located 100 feet south of the 241-TX Tank Farm.	Receives process and steam condensate from the 242-T Building and conden- sate from the 296-T & Stack.	104	H-2-806 H-2-32526

<u>Liquid Effluent</u>				<u>In-Line Monitoring and Alarm System</u>
<u>Facility</u>	<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	
242-T Building	Batch (3.6 X 10 ⁵ gal/mo.)	Waste tank volume	---	None
296-T & Stack	Continuous	None	None	None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
42C	Condensate catch tank located in the cold cell of the 242-T Building.	Tank sample	3800 gallon batch	Every batch	100 ml	One-month (W4M) per- iod by PNL
42D	Condensate effluent line to the 216-T 19 Crib.	Line sample	Weekly	Once per week	100 ml	One-month period (W4D) by PNL

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
42C	341
42D	341

--- Not applicable

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LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-T 35 Crib	Located 1,500 feet northeast of the 221-T Building.	Receives miscellaneous laboratory waste from the 300 Area.	105	H-2-33446

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>
As required	Waste tank car volume	---

In-Line Monitoring
and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>	<u>Liquid Sample</u>
		<u>Type</u>	<u>Volume</u>
T-35	Railroad tank car located at the 300 Area before shipment.	Tank car sample	Every 10,000 gallons to tank car
		20,000 gallon batch	100 ml
			One-month period to PML

ANALYTICAL PROCEDURE

PML

--- Not applicable

LIQUID EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-U 4A French Drain	Located 20 feet south of the 222-U Building.	Receives liquid waste from PNL operations in the 222-U Building.	106	H-2-32527 H-2-43081

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None	None

LIQUID EFFLUENT SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-U 4B French Drain	Located 20 feet east of the 222-U Building.	Receives liquid waste from PNL operations in the 222-U Building.	99	H-2-32527 H-2-43081

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None	None

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LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-U 10 Swamp	Located 1,000 feet west of the 241-S Tank Farm.	Receives liquid waste from the 216-U 14 and 216-Z 11 Ditches, and cooling water from the 241-SX Tank Farm.	107	SX-2-1888 H-2-2430 H-2-32527
<u>Facility</u>	<u>Discharge</u>	<u>Liquid Effluent to Swamp</u> <u>Measurement</u>	<u>Rate Check</u>	<u>In-Line Monitoring and Alarm System</u>
241-SX Tank Farm	Continuous (24.3 X 10 ⁶ gal/mo.)	Flow recorder	Non-routine request	None
216-U 14 Ditch	See Page 289.			
216-Z 11 Ditch	See page 293.			

SAMPLING

<u>Designation</u>	<u>Effluent</u>	<u>Location</u>	<u>Type</u>	<u>Sampling</u> <u>Collected</u>
U-10	241-SX cooling water	Inlet line to the 216-U 10 Swamp.	Dip sample	Weekly
Pond North	---	West of the 216-Z 11 Ditch inlet to the 216-U 10 Swamp.	Dip sample	Weekly
Pond South	---	South of the 216-U 14 Ditch inlet to the 216-U 10 Swamp.	Dip sample	Weekly

--- Not applicable

216-U 10 (continued)
SAMPLING (continued)

<u>Designation</u>	<u>Liquid Sample</u>		<u>Composited</u>
	<u>Pulled</u>	<u>Volume</u>	
U-10	Once per week	250 ml	One-month period by PNL
Pond North	Once per week	100 ml	None
Pond South	Once per week	100 ml	None

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
U-10	343
Pond North	341
Pond South	341

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LIQUID EFFLUENT SYSTEMWASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-U 14 Ditch	The head end of the ditch is located 550 feet southeast of the 241-TX Tank Farm. It extends 3,000 feet to the south and southwest, passing to the west of the 207-U Retention Basin. The ditch then extends another 1,300 feet where it abruptly turns west for another 1,500 feet before emptying into the 216-U 10 Swamp.	Receives chemical sewer waste from the 221-U Building, cooling water from the 224-U Building, liquid waste from the 2724-W Building, and waste water from the 284-W Power House.	108	H-2-32527

<u>Facility</u>	<u>Discharge</u>	<u>Liquid Effluent to Ditch</u> <u>Measurement</u>	<u>Rate Check</u>	<u>In-Line Monitoring</u> <u>and Alarm System</u>
221-U Building	Continuous ($\sim 2.5 \times 10^4$ gal/mo.)	None	Non-routine request.	None
224-U Building	Continuous ($\sim 1.8 \times 10^7$ gal/mo.)	Flow recorder	Non-routine request.	None
284-W Power House	Continuous ($\sim 4.7 \times 10^7$ gal/mo.)	Estimated from the steam production.	Non-routine request.	None
2724-W Building	Continuous ($\sim 1.5 \times 10^6$ gal/mo.)	Estimated from the raw water input to the Building.	Non-routine request.	None

216-U 14 (continued)

SAMPLING

<u>Designation</u>	<u>Effluent</u>	<u>Location</u>	<u>Sampling</u>	
			<u>Type</u>	<u>Collected</u>
Pond	224-U cooling water	207-U Retention Drain	Proportional sample	Seven-day period
Laundry Waste	284-W Power House and 2724-W Building liquid waste.	Inlet line to the head end of the 216-U 14 Ditch.	Dip sample	Weekly

	<u>Liquid Sample</u>		
	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
Pond	Once per week	1,000 ml	One-week and one-month period
Laundry Waste	Once per week	100 ml	None

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
Pond	341
Laundry Waste	341

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LIQUID EFFLUENT SYSTEM
WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-Z 11 Ditch	The head end of the ditch is located 700 feet southeast of the 234-5 Building. It extends 2,000 feet to the south and then turns southwest for another 1,000 feet emptying into the 216-U 10 Swamp.	Receives steam condensate, cooling water, and waste water from the 234-5 Building, ventilation cooling water from PNL operations in the 231-Z Building, and vacuum pump seal water from the 291-Z Building.	109	H-2-16521 H-2-32527 H-2-32528

<u>Facility</u>	<u>Discharge</u>	<u>Liquid Effluent to Ditch</u>		<u>In-Line Monitoring and Alarm System</u>
		<u>Measurement</u>	<u>Rate Check</u>	
234-5 Building	Continuous (~6.0 X 10 ⁶ gal/mo.)	Estimated from the sanitary water input to the 234-5 Building.	Non-routine request.	None
231-Z Building	Continuous (~5.0 X 10 ⁶ gal/mo.)	Estimated from the raw water input to the 231-Z Building.	Non-routine request.	None
291-Z Building	Continuous (Included with 234-5)	None	Non-routine request.	None

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216-Z 11 (continued)

SAMPLING

<u>Designation</u>	<u>Effluent</u>	<u>Location</u>	<u>Sampling</u>	
			<u>Type</u>	<u>Collected</u>
291-Z	291-Z vacuum pump seal water.	291-Z Sump	Proportional sample	One-week period
234-5 Ditch	234-5 cooling water and steam condensate.	South side of 16th Street at the 216-Z 11 Ditch.	Dip sample	Weekly
231-Z Ditch	231-Z cooling water.	Inlet line to the head end of the 216-Z 11 Ditch.	Dip sample	Weekly

	<u>Liquid Sample</u>		
	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
291-Z	Once per week	30 ml	None
234-5 Ditch	Once per week	100 ml	None
231-Z Ditch	Once per week	100 ml	None

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
291-Z	347
234-5 Ditch	241
231-Z Ditch	241

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LIQUID EFFLUENT SYSTEM

WASTE MANAGEMENT SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-Z 16 Crib	Located 300 feet north of the 231-Z Building.	Receives liquid waste from BNW operations in the 231-Z Building.	110	H-2-26074

<u>Liquid Effluent</u>			<u>In-Line Monitoring and Alarm System</u>
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	
Continuous ($\sim 5.2 \times 10^5$ gal/mo.)	Flow recorder	Non-routine request	None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
231-Z	Located at the weir north of the 231-Z Building.	Proportional sample	Seven-day period	Once per week	250 ml	None

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
231-Z	341

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LIQUID EFFLUENT SYSTEM

TECHNICAL SERVICES SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-S 20 *	Located 300 feet east of the 222-S Building.	Receives liquid waste from the 222-S Building via the 102-S Storage Tank in the 219-S Vault.	111	H-2-5229 H-2-32525

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Batch (4.0×10^3 gal/mo.)	Waste tank volume	---

In-Line Monitoring and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
S-20	Waste receiver tank 102-S located in the 219-S Vault.	Tank sample	4,100 gallon batch	Every batch	5 ml	One-month period

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
S-20	343

* Inactive (standby) as of February 20, 1969.
--- Not applicable

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LIQUID EFFLUENT SYSTEM

CPD SERVICES SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-T 29 French Drain	Located 200 feet north of the 291-T Building.	Receives floor drain waste from the 291-T Building.	113	H-2-32526

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None	None

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LIQUID EFFLUENT SYSTEMCPD SERVICES SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-T 36 Crib	Located 300 feet south of the 241-T Tank Farm.	Receives decontamination wastes from the 221-T and 221-U Buildings.	114	H-2-33472

<u>Liquid Effluent</u>			<u>In-Line Monitoring and Alarm System</u>
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	
Batch (~8,000 gal/mo.)*	Waste tank volume	---	None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
5-6, 5-9	Waste receiver tanks 5-6, 5-9, and 15-1 located in the 221-T Building, and waste receiver tank 5-7 located in the 221-U Building.	Tanks 5-6 and 5-9 samples	4,500 gallon batch	Every batch	200 ml	One-month period
15-1, and		Tank 15-1 sample	15,000 gallon batch	Every batch	200 ml	One-month period
5-7		Tank 5-7 sample	8,000 gallon batch	Every batch	200 ml	One-month period

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
* Decontamination waste not meeting crib specifications is transfer to UGS.	341
---	341
Not applicable	341
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LIQUID EFFLUENT SYSTEM

CPD SERVICES SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-U 7 French Drain	Located 10 feet east of the 221-U Building.	Receives drain waste from the 221-U Blower Pit.	115	H-2-32527 H-2-43039

<u>Discharge</u>	<u>Liquid Effluent Measurement</u>	<u>Rate Check</u>	<u>Sampling</u>	<u>In-Line Monitoring and Alarm System</u>	<u>Analytical Procedure</u>
As required	None	None	None	None	None

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LIQUID EFFLUENT SYSTEM
PLUTONIUM FINISHING SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-Z 1A* Tile Field	Located 580 feet south of the 236-Z Building.	Receives high salt aqueous and organic waste from the 242-Z Building.	117	H-2-24923 H-2-32528

<u>LIQUID EFFLUENT</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Batch (~2.2 X 10 ⁴ gal/mo.)	Waste Tank volume	---

In-Line Monitoring
and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
Z-1A	Waste receiver tanks W-3, W-4, and W-12 located in the 242-Z Building.	Tank Sample	260 gallon batch	Every batch	30 ml	None

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
Z-1A	347

- Inactive as of March 6, 1969.
Replaced by 216-Z 18 Crib.

--- Not applicable

LIQUID EFFLUENT SYSTEM
PLUTONIUM FINISHING SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-Z 1&2 Cribs	Located 400 feet south of the 236-Z Building.	Receives intermittent aqueous and organic liquid waste from the 234-5, 236-Z, and the 242-Z Buildings.	118	H-2-16459 H-2-32528

<u>Liquid Effluent</u>			<u>In-Line Monitoring and Alarm System</u>
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>	
Batch 3 (~1.2 X 10 gal/mo.)	Waste Tank volume	---	None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
Z-1	Waste receiver tanks 39 and 40 located in the 236-Z Building.	Tank Sample	50 gallon batch	Every batch	30 ml	None

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
Z-1	347

--- Not applicable

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LIQUID EFFLUENT SYSTEM
PLUTONIUM FINISHING SECTION

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-Z 12 Crib	Located 400 feet southwest of the 234-5 Building.	Receives aqueous liquid waste from the 234-5, 232-Z, 236-Z, and the 242-Z Buildings.	119	H-2-20987 H-2-32528

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Batch (1.4×10^5 gal/mo.)	Waste Tank volume	---

In-Line Monitoring
and Alarm System

None

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		<u>Liquid Sample</u>		
		<u>Type</u>	<u>Collected</u>	<u>Pulled</u>	<u>Volume</u>	<u>Composited</u>
Z-12	Waste receiver tanks D-4 through D-8 located in the 241-Z Sump Area.	Tank Sample	3200 gallon batch	Every batch	30 ml	One-month period (D-6)

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
Z-12	347

--- Not applicable

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LIQUID EFFLUENT SYSTEM

<u>Designation</u>	<u>Location</u>	<u>Function</u>	<u>Page</u>	<u>Reference Drawing</u>
216-Z 18* Crib	Located 900 feet south of the 234-5 Building.	Receives high salt aqueous and organic waste from the 242-Z Building.	120	H-2-26093 H-2-26094

In-Line Monitoring
and Alarm System

None

<u>Liquid Effluent</u>		
<u>Discharge</u>	<u>Measurement</u>	<u>Rate Check</u>
Batch (~2.2 x 10 ⁴ gal/mo.)	Waste tank volume	---

SAMPLING

<u>Designation</u>	<u>Location</u>	<u>Sampling</u>		
		<u>Type</u>	<u>Collected</u>	<u>Liquid Sample</u> <u>Pulled</u> <u>Volume</u> <u>Composited</u>
Z-18	Waste receiver tanks W-3, W-4, and W-12 located in the 242-Z Building.	Tank sample	260 gallon batch	Every batch 30 ml None

ANALYTICAL PROCEDURE

<u>Designation</u>	<u>Page</u>
Z-18	347

* Replaces the 216-Z 1A Field.

PUREX ANALYTICAL LABORATORY
ANALYTICAL PROCEDURES FOR LIQUID EFFLUENTS

<u>Sample Designation</u>	<u>Page</u>	<u>Procedure Designation</u> ¹	<u>Counter</u>	<u>Detector</u>		
				<u>Type</u>	<u>Sensitivity</u>	<u>Geometry</u>
A-6,	255	PuA-20a or c(Pu)	Alpha Simpson Proportional	Ionization	Alpha	Fixed
A-10,	256		Counter (ASP)	(CH ₄ gas)		geometry
Pump Pit (A-25),	270	BG-2a (Beta) ²	Beta Proportional	Ionization	Beta and gamma	Second
U3 and 4 (A-27),	261		Counter (BPC)	(CH ₄ gas)		shelf
A-27,	261	Uf-1c(U)	Fluorimeter	Fluorescence	Photo sensitive	Fixed
A-30, and	262					geometry
A-36.	264	PuA-6b(Pu)	ASP and Alpha Energy Analysis (AEA)	Solid state detector	Alpha	Fixed geometry

<u>Composite Designation</u>	<u>Page</u>	<u>Procedure Designation</u> ¹	<u>Counter</u>	<u>Detector</u>			
				<u>Type</u>	<u>Sensitivity</u>	<u>Crystal</u>	<u>Geometry</u>
A-6,	255	Sr-1a (Sr. total)	Beta Proportional	Ionization	Beta and gamma	---	Second
A-10,	256		Counter (BPC)	(CH ₄ gas)			Shelf
Pump Pit (A-25),	270						
A-27,	261	CoG-1a(⁶⁰ Co)	400 Channel Analyzer (400)	Scintillation	Gamma	NaI	---
Chemical Sewer (A-29),	274	CsG-2a(¹³⁷ Cs)					
A-30, and	262	E-1a(¹⁰⁶ Ru-Rh)					
A-36.	264						

¹ Other procedures may be used as approved by the Manager of Separations Chemistry Laboratory and the Manager of Technical Services.

² Samples are counted through a gold absorber.

--- Not applicable.

LIQUID EFFLUENTS (Continued)

Counter	Detection			Maximum Permissible Concentration in Water ²
	Count	Response	Lower Limit ¹	
ASP	4 min.	2 d/c ²³⁹ Pu	0.2×10^{-7} μ Ci/ml ²³⁹ Pu	1000×10^{-7} μ Ci/ml ²³⁹ Pu
BPC	5 min.	6 d/c Beta	0.1×10^{-7} μ Ci/ml Beta	40×10^{-7} μ Ci/ml ⁹⁰ Sr
		3 d/c ⁹⁰ Sr	30.0×10^{-7} μ Ci/ml ⁹⁰ Sr	40×10^{-7} μ Ci/ml ⁹⁰ Sr
Fluorimeter	---	---	0.2×10^{-6} μ Ci/ml ²³⁸ U	1000×10^{-6} μ Ci/ml ²³⁸ U
400	10 min.	20 d/c ⁶⁰ Co	0.2×10^{-5} μ Ci/ml ⁶⁰ Co	100×10^{-5} μ Ci/ml ⁶⁰ Co
		13 d/c ¹³⁷ Cs	2.0×10^{-6} μ Ci/ml ¹³⁷ Cs	400×10^{-6} μ Ci/ml ¹³⁷ Cs
		83 d/c ¹⁰⁶ Ru-Rh	6.0×10^{-6} μ Ci/ml ¹⁰⁶ Ru-Rh	400×10^{-6} μ Ci/ml ¹⁰⁶ Ru-Rh

Counter

Detection Qualifications

ASP

Assume no solids are present on the sample mount.

The detector response is monitored with a ²³⁹Pu standard mounted on a stainless steel plate.

The alpha is calculated as ²³⁹Pu.

The lower limit is meaningful only if the net sample count is greater than one count per minute above the background count.

BPC

Assume no loss of mounted sample due to evaporation.

Assume no solids are present on the sample mount.

The detector response is monitored with a ⁹⁰Sr-Y standard mounted on a stainless steel dish.

The lower detection limit is meaningful only if the net sample count is greater than one-fourth of the background count.

¹ See "Detection Qualifications" on pages 338 and 339.

² Controlled Areas (See reference 17.)

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LIQUID EFFLUENTS (Continued)
Detection Qualifications (Continued)

Counter

Detection Qualifications

Fluorimeter

Assume no loss of mounted sample during boil down treatment.

Assume no inseparable quenching agents are present.

Assume the flux mix is constant.

Assume all conditions of flaming and cooling of the flux melt are constant.

Assume the reflection from the dishes used in the analysis is uniform.

400

Assume no loss of mounted sample due to evaporation.

The detector response is monitored with $^{144}\text{Ce-Pr}$, ^{60}Co , and ^{137}Cs standards for energy evaluation and ^{137}Cs and ^{54}Mn standards for recovery calibrations all mounted on stainless steel dishes.

The lower limit is meaningful only if the sample count, after gamma isotopic correction, is greater than 10 counts per minute.

The lower limit will increase significantly in the presence of other isotopes depending on their relative energies and abundance.

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REDOX ANALYTICAL LABORATORY
ANALYTICAL PROCEDURES FOR LIQUID EFFLUENTS

<u>Sample Designation</u>	<u>Page</u>	<u>Procedure Designation</u> ¹	<u>Counter</u>	<u>Detector</u>		
				<u>Type</u>	<u>Sensitivity</u>	<u>Geometry</u>
Swamp Inlet (A-25),	270	BG-2a (Alpha and beta)	Beckman Wide Beta II (BWB)	Ionization (CH ₄ gas)	Alpha or beta	Fixed geometry
Swamp North (A-25),	270					
Chemical Sewer (A-29),	274					
B and C Farm Water (B-2),	278					
Ditch Inlet (B-3),	281					
Swamp North (B-3),	281					
Hot Semiworks (C-9),	296					
222-S Swamp (S-19),	305					
T Plant Swamp (T-4),	313					
Pond North (U-10),	320					
Pond South (U-10),	320					
Laundry Waste (U-14),	322					
234-5 Ditch (Z-11),	324					
231-Z Ditch (Z-11), and	324					
231-Z (Z-16).	325					
CSP,	278	BG-2a (Beta)	Beckman Wide Beta II (BWB)	Ionization (CH ₄ gas)	Alpha or beta	Fixed geometry
CNP,	278					
CCR,	278					
BCP,	283					
BCS,	287					
42C,	315					
42D,	315					
5-6, 7 and 9 (T-36),	330					
15-1 (T-36),	330					
C-5 (U-12), and	265					
Pond (U-14).	322					

¹ Other procedures may be used as approved by the
Manager of Separations Chemistry Laboratory and
the Manager of Technical Services.

LIQUID EFFLUENTS (Continued)

Sample Designation	Page	Procedure Designation ¹	Counter	Detector			
				Type	Sensitivity	Crystal	Geometry
BCP, 5-6,7 and 9 (T-36), and 15-1 (T-36).	283	GEA (¹⁴⁴ Ce-Pr)	400 Channel Analyzer (400)	Scintillation	Gamma	NaI	---
	330	(⁶⁰ Co)					
		(¹³⁷ Cs)					
	330	(¹⁰⁶ Ru-Rh) (¹²⁵ Sb) (⁹⁵ Zr-Nb)					
C-5 (U-12), and Pond (U-14).	265	UF-1b or	Fluorimeter	Fluorescence	Photo sensitive	---	Fixed geometry
	322	UF-1c (U)					
Composite Designation							
5-6, 7, and 9 (T-36), and 15-1 (T-36).	330	BG-2a (Alpha and beta)	Beckman Wide Beta II (BWB)	Ionization (CH ₄ gas)	Alpha or beta	---	Fixed geometry
	330	PmB-102(¹⁴⁷ Pm) SrB-351(⁹⁰ Sr)					
		GEA (¹⁴⁴ Ce-Pr)	400 Channel Analyzer (400)	Scintillation	Gamma	NaI	---
		(⁶⁰ Co)					
	(¹³⁷ Cs) (¹⁰⁶ Ru-Rh) (¹²⁵ Sb) (⁹⁵ Zr-Nb)						
C-5 (U-12) and Pond (U-14).	265	BG-2a (Beta)	Beckman Wide Beta II (BWB)	Ionization (CH ₄ gas)	Alpha or beta	---	Fixed geometry
	290	UF-1b or 1c (U)	Fluorimeter	Fluorescence	Photo sensitive	---	Fixed geometry

¹ Other procedures may be used as approved by the
Manager of Separations Chemistry Laboratory and
the Manager of Technical Services.

--- Not applicable.

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LIQUID EFFLUENTS (Continued)

<u>Sample Designation</u>	<u>Page</u>	<u>Composite Designation</u>
AO8,	267	A8C,
CA8,	270	CAC,
CAR,	270	ARC,
A-39,	275	A-39,
CSP and CNP,	278	CBC,
BCE,	278	BCE,
CTS,	278	CTC,
C2S,	278	C2M,
CCR,	278	CCC,
BCP,	283	BCP,
ITS,	286	ITM,
BCS,	287	BCS,
2TS,	289	2TM,
B-58,	290	B-59,
CSW,	296	CSC,
S-6,	299	S-6,
S-9,	301	S-9,
S-11,	302	S-11,
Pond 1 (S-16),	304	Pond 1,
S-19,	305	S-19,
S-20,	327	S-20,
S-21,	306	S-21,
S-23,	307	S-23,
S-16,	309	S-16,
C4N and C4S, and	313	C4C, and
U-10.	319	U-10.

Analytical Procedure

Samples with a CP instrument reading of less than 50 mR beta-gamma at the bottom of the sample bottle are delivered to Battelle Northwest Laboratory for analysis.

Samples with a CP reading greater than 50 mR are analyzed at the 222-S Analytical Laboratory.

Samples are analyzed for total alpha, total beta, ^{147}Pm , ^{90}Sr , U, and gamma scan.

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LIQUID EFFLUENTS (Continued)

Counter	Count	Detection		Maximum Permissible Concentration in Water ²
		Response	Lower Limit ¹	
BWB	5 min.	4.51 d/c ²³⁹ Pu	0.2×10^{-6} μ Ci/ml ²³⁹ Pu	100×10^{-6} μ Ci/ml ²³⁹ Pu
		3.36 d/c Beta	3.4×10^{-6} μ Ci/ml Beta	4×10^{-6} μ Ci/ml ⁹⁰ Sr
		4.34 d/c ¹⁴⁷ Pm	0.4×10^{-5} μ Ci/ml ¹⁴⁷ Pm	600×10^{-5} μ Ci/ml ¹⁴⁷ Pm
		2.55 d/c ⁹⁰ Sr	2.7×10^{-6} μ Ci/ml ⁹⁰ Sr	4×10^{-6} μ Ci/ml ⁹⁰ Sr
400	15 min.	2.86 d/c ¹⁴⁴ Ce-Pr	2.0×10^{-5} μ Ci/ml ¹⁴⁴ Ce-Pr	30×10^{-5} μ Ci/ml ¹⁴⁴ Ce-Pr
		3.36 d/c ⁶⁰ Co	8.1×10^{-6} μ Ci/ml ⁶⁰ Co	1000×10^{-6} μ Ci/ml ⁶⁰ Co
		2.50 d/c ¹³⁷ Cs	4.3×10^{-6} μ Ci/ml ¹³⁷ Cs	400×10^{-6} μ Ci/ml ¹³⁷ Cs
		4.93 d/c ¹⁰⁶ Ru-Rh	2.9×10^{-5} μ Ci/ml ¹⁰⁶ Ru-Rh	40×10^{-5} μ Ci/ml ¹⁰⁶ Ru-Rh
		3.85 d/c ¹²⁵ Sb	6.2×10^{-6} μ Ci/ml ¹²⁵ Sb	3000×10^{-6} μ Ci/ml ¹²⁵ Sb
		3.94 d/c ⁹⁵ Zr-Nb	4.1×10^{-6} μ Ci/ml ⁹⁵ Zr-Nb	2000×10^{-6} μ Ci/ml ⁹⁵ Zr-Nb
Fluorimeter	---	---	2.0×10^{-6} μ Ci/ml ²³⁸ U	1000×10^{-6} μ Ci/ml ²³⁸ U

Counter

Detection Qualifications

BWB

Assume a direct mount of nine milliliters from the original sample.

Assume no loss of mounted sample due to evaporation.

Assume no solids are present on the sample mount.

The alpha detector response is monitored with an ²⁴¹Am standard mounted on a stainless steel plate.

The alpha is calculated as ²³⁹Pu.

¹ See "Detection Qualifications" on pages 344 and 345.

² Controlled Areas (see reference 17.)

³ If the total beta analysis is calculated as ⁹⁰Sr, it will then meet ⁹⁰Sr specifications.

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LIQUID EFFLUENTS (Continued)
Detection Qualifications (Continued)

Counter

Detection Qualifications

BWB

The beta detector response is monitored with ^{137}Cs , ^{151}Sm , and ^{90}Sr standards mounted on a stainless steel plate.

The lower limit is meaningful only if the sample count is greater than twice the background count.

400

Assume no loss of mounted sample due to evaporation.

The detector response is monitored with a ^{54}Mn standard mounted on a stainless steel plate.

The lower limit is meaningful only if the sample count, after gamma isotopic correction, is greater than 100 counts per 15 minutes.

The lower limit will increase significantly in the presence of other isotopes depending on their relative energies and abundance.

Fluorimeter

Assume no loss of mounted sample during boil down treatment.

Assume no inseparable quenching or enhancing agents are present.

Assume the flux mix is constant.

Assume all conditions of flaming and cooling of the flux melt are constant.

Assume reflection from the dishes used in the analysis is uniform.

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PLUTONIUM FINISHING ANALYTICAL LABORATORY
ANALYTICAL PROCEDURES FOR LIQUID EFFLUENTS

<u>Sample Designation</u>	<u>Page</u>	<u>Liquid Sample</u>	<u>Procedure Designation</u> ¹	<u>Counter</u>	<u>Detector</u>		
					<u>Type</u>	<u>Sensitivity</u>	<u>Geometry</u>
Z-1A and Z-18	333	Each W-3, W-4, and W-12 (organic) batch.	PuA-6b (AEA and alpha count)	Alpha energy analyzer (AEA)	Surface Barrier (Gold diode)	Alpha energy spectra	Fixed geometry
	336		PuA-6b (Alpha)	Alpha Simpson Proportional Counter (ASP)	Ionization (CH ₄ gas)	Alpha	Fixed geometry
Z-1	334	Each tank 39 or 40 batch that is cribbed.	PuA-6b (Alpha)	Alpha Simpson Proportional Counter	Ionization (CH ₄ gas)	Alpha	Fixed geometry
291-Z	324	Weekly composite					
Z-12	335	Each D-7 and D-8 batch. Each D-4 and D-5 batch as requested.					
Z-12	335	Monthly composite upon request from R & E.					

¹ Other procedures may be used as approved by the Manager of Separations Chemistry Laboratory and the Manager of Plutonium Finishing Analytical Laboratory.

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LIQUID EFFLUENTS (Continued)

<u>Counter</u>	<u>Count</u>	<u>Response</u>	<u>Lower Limit</u> ¹	<u>Maximum Permissible Concentration in Water</u> ²
AEA	~30.00 min.	1000 d/m Alpha	4.5×10^{-4} $\mu\text{Ci/ml}$ ^{239}Pu	1×10^{-4} $\mu\text{Ci/ml}$ ^{239}Pu
ASP	5.00 min. or 5.12 min.	20 d/m Alpha	9.0×10^{-6} $\mu\text{Ci/ml}$ ^{239}Pu	100×10^{-6} $\mu\text{Ci/ml}$ ^{239}Pu

<u>Counter</u>	<u>Detection Qualifications</u>
AEA	<p>The resolution of the detector is dependent on any solids present after deposition of the sample. The minor isotopes must exceed 20 c/m.</p> <p>The detector response is monitored with Pu-Am standard disc.</p> <p>The instrument can only differentiate energy levels greater than 35-50 KEV apart.</p> <p>The sample is counted until 2000 ^{239}Pu alpha counts have been collected.</p> <p>The lower detection limit is meaningful only if the ^{239}Pu sample count is greater than 500 counts per minute.</p>
ASP	<p>Assume no solids are present on the sample mount.</p> <p>The detector response is monitored with a ^{239}Pu standard mounted on a stainless steel plate.</p> <p>An isotopic correction factor (F factor) is used to calculate the ^{239}Pu from the total alpha count.</p> <p>The lower detection limit is meaningful only if the ^{239}Pu sample count is greater than 10 counts per minute above the background count.</p>

¹ See "Detection Qualifications" above.

² Controlled Areas (See reference 17.)

**DATE
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10/21/94

END