OUTGOING LTR. NO.
29791-R3
INCOMING LTR. NO.
29791
ACTION
Prosser/
HEINE
REPLY DUE

DIST.: Albaugh, J.F. X X; Bartholomew, R.C.; Bellafatto, M.; Berry, J.M.; Crawford X X X; Eichman, J.L.; Pol, E.V. X X X; ... ; Cruz, R.S. X X; Ganzini, P.G. X X; McDermott, R.J.; ... X X X; ... X X; ... X X; Contract Administrator X X; Central Files X X; F HEINE X X; ...

Rockwell Hanford Operations
P.O. Box 800
Richland, WA 99352

Rockwell
International

March 28, 1986

In reply, refer to letter 29791,R3

Mr. R. E. Gerton, Director
Environment, Safety and Health Division

Mr. J. D. White, Director
Waste Management Division
Department of Energy
Richland Operations Office
Richland, Washington 99352

Gentlemen:

RESPONSE TO COMPLIANCE ORDER DE-85-677
(Contract DE-AC06-77RL01030)

References: (a) Letter, February 6, 1986, R. E. Gerton to General Manager, Rockwell Hanford Operations, "Compliance Order No. DE-85-677"

(b) Letter, February 19, 1986, J. F. Albaugh and W. F. Heine to R. E. Gerton and J. D. White, "Response to Compliance Order DE-85-677"

(c) Letter, March 11, 1986, M. J. Lawrence to Contractors, Richland, Washington, "Establishment of Environmental Compliance Task Force"

(d) Letter, March 14, 1986, J. F. Albaugh and W. F. Heine to R. E. Gerton and J. D. White, "Response to Compliance Order DE-85-677"

The Washington Department of Ecology (WDOE) Compliance Order DE-85-677 required responses to five items. References (b) and (d) provided the necessary documentation to satisfy Items 2 and 3. This letter provides the remaining responses required for Items 1, 4 and 5.

Attachment 1, "200 Area Hazardous Chemical Management Upgrade Plan" identifies plant modifications and other actions which either have already been implemented or will be implemented. The report, although focusing on PUREX, also provides information on other Rockwell Hanford Operations (Rockwell) chemical sewer actions. This report satisfies the requirements in the Compliance Order Items 1 and 5. Department of Energy - Richland Operations Office (DOE-RL) was required to respond to this item by May 1, 1986.

The Compliance Item 4 response, required by April 1, 1986, is met partially by the attachment to Reference (d) and partially by Attachment 2 of this letter. Attachment 2, the revised "Chemical Sewer Management" letter, describes current chemical sewer management policies. The extensive ap-

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Rockwell International

proval signatures on the letter reflect Rockwell's commitment to meeting all regulatory requirements. It should also be noted that the new guidance provided in the Chemical Sewer Management letter will be incorporated into a revised Chemical Sewer Management Plan within the next two months.

Attachment 3, although not specifically required to respond to the Compliance Order, is being provided as a reminder of the many actions which were in progress even before the Compliance Order was issued. Attachment 3 is a detailed list of actions taken or being evaluated within each Rockwell operating facility to prevent the release of hazardous wastes to the environment. This list is updated every six weeks and reviewed by the Rockwell general management staff to assure that adequate attention continues to be given to the proper management of the chemical sewers.

As shown by the information contained in these attachments, Rockwell has been, and is continuing to, aggressively pursue methods to prevent the release of hazardous wastes to the environment. In virtually all cases, the actions taken to date have proven to be effective. Rockwell is, nonetheless, continuing to identify and implement additional controls to further guarantee the protection of the environment. In accordance with Reference (c), Rockwell will continue its ongoing efforts to fully comply with all environmental regulations.

If you have any questions regarding any of the information provided, please contact G. S. Shirey on 373-1071 or L. L. Powers on 373-4981.

Very truly yours,

J. F. Albaugh, Director
Safety and Quality Assurance

W. F Heine, Program Manager
Environmental Control Program

JFA/WFH:LLP/GCS:nl

Att. 3

cc: R. W. Brown - DOE-RL
P. E. Rasmussen - DOE-RL
D. P. Simonson - DOE-RL

ATTACHMENT 1

200 AREA HAZARDOUS CHEMICAL MANAGEMENT UPGRADE PLAN

March 21, 1986

Prepared by
Rockwell Hanford Operations
Division of Rockwell International
Richland, Washington

for the
U. S. Department of Energy
Richland Operations Office
Richland, Washington

ATTACHMENT 1

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continued

ABSTRACT

This report discusses plant design modifications required at the Plutonium and Uranium Extraction (PUREX) Facility, as well as other facilities in the Hanford 200 East and 200 West Areas, which are required to achieve compliance with hazardous chemical management measures specified in Compliance Order DE-85-677, issued by the State of Washington, Department of Ecology on January 15, 1986. It was compiled by the Rockwell Hanford Operations, Waste Management and Chemical Processing Program Offices for the United States Department of Energy, Richland Operations Office, and summarizes the upgrades planned for the PUREX aqueous make-up (AMU) area, the 211-A Bulk Chemical Storage Area, the Piping and Operating (P&O) Gallery, and other related areas presently served by the chemical sewer. The objective of these upgrades is to prevent hazardous chemicals from entering the chemical sewer and reaching the environment in detrimental quantities or concentrations.

ATTACHMENT 1

1.0 INTRODUCTION

1.1 BACKGROUND

On January 15, 1986 the State of Washington, Department of Ecology (WDOE) issued Compliance Order No. DE-85-677 to the United States Department of Energy, Richland Operations Office (DOE-RL) regarding five specific actions relating to the prevention of hazardous chemical releases to the environment. The compliance order specifically cited chemical releases at the Plutonium and Uranium Extraction (PUREX) Facility between January 18 and August 6, 1985 as bases for action under the provisions of RCW 90.48.120. The order requested that appropriate actions be taken on the following issues, by the dates indicated:

(1) By April 1, 1986, install an aqueous makeup unit (AMU) high-level alarm system in the central control room.

(2) By April 1, 1986, install a pH meter in the chemical sewer system, downstream from the AMUs and the 211-A building, which alarms in the central control room. The pH meter(s) shall be calibrated such that pH values of less than 6.0 and greater than 9.0 shall signal the alarm.

(3) Immediately upon receipt of this Order, implement procedures which require process operators to continuously monitor AMU tanks during material transfers. This shall include techniques which improve communication lines between employees during material transfers, operations, and shift changes.

(4) By April 1, 1986, develop, implement, and submit to the Department of Ecology, waste management methods that will be utilized to manage unwanted, discarded, or otherwise spent waste chemicals from the aqueous make-up units. This submittal shall ensure and document that the intentional discharge of these materials has ceased and that all Federal and state regulatory requirements are met. This report shall furthermore document the procedures that USDOE has taken to minimize the accidental or negligent release of waste chemicals into the sewers.

(5) By May 1, 1986, submit to the Department of Ecology a report which identifies engineering (waste management) options that preclude the release of waste chemicals into the chemical sewers. This report shall contain decision schedules which identify the issues involved and the point in time when the selection, implementation, and completion of the necessary engineering and construction will take place.

Items 2 and 3 have been addressed separately from this report. Item 4 is also being addressed separately in another submittal. This report responds to items 1 and 5 specifically.

1.2 OBJECTIVE

Rockwell Hanford Operations has been aggressively pursuing administrative and engineered controls to prevent the discharge of hazardous wastes to the chemical sewer systems. The objective of this report is to describe those actions which have been implemented to date, are scheduled to be implemented, or are being considered for implementation. Due to the complexity of the PUREX operations and the quantities of chemicals used, the primary emphasis of this report is PUREX. Studies are currently in progress to address chemical sewer practices at all Rockwell facilities. A report describing the results of the engineering studies will be issued by September 30, 1986.

It should be noted that although Rockwell and the Department of Energy have placed a high priority on the installation of engineered controls or barriers for all chemical sewers, schedules identified herein are dependent upon budget approval, and may be affected by future budgetary constraints. This work, however, will continue to have a high priority and may supersede lower priority work to the extent practical without jeopardizing safety or commitments in other areas.

2.0 PLUTONIUM AND URANIUM EXTRACTION (PUREX) FACILITY

2.1 PLANT DESCRIPTION

The Plutonium and Uranium Extraction (PUREX) Facility, located in the 200 East Area, was designed and constructed in the mid-1950s to separate plutonium and uranium from irradiated fuel. The PUREX plant began processing spent reactor fuel in 1956, using nitric acid as the initial fuel dissolution agent followed by the selective removal of desired materials by subsequent chemical extraction processes. These PUREX processes are designed for the individual separation of uranium, plutonium, neptunium, and fission products by controlling their relative phase distributions between aqueous solutions and an immiscible organic solvent dissolved in a hydrocarbon diluent. Improvements have been made to increase production rates, provide capabilities to handle a wider range of fuels, provide higher product quality, decrease environmental releases, and improve the safety of the operation.

The plant was placed in standby in 1972, until national defense needs prompted its restart in 1983. The PUREX plant is currently processing fuel from Hanford's N Reactor, to provide nuclear materials for national defense programs, research and reactor development, and safety programs. The plant will remain in operation beyond the year 2000, in continuation of its present mission.

The PUREX plant design utilizes existing liquid waste disposal facilities, such as cribs and ponds, to dispose of most liquid waste streams. Cribs are underground settling beds using perforated pipes on wide gravel beds, to which waste water streams that can potentially contain low level radioactive contaminants can be routed. Ponds are surface water impoundments that use both atmospheric evaporation and ground percolation to dispose of waste water. The primary waste water system leaving the plant has been historically referred to as the "chemical sewer", since the original design philosophy included the disposal of waste chemicals in the plant's primary waste water stream. The major constituent in PUREX waste water, however, is cooling water used in various plant processes and equipment. The cooling water discharge from PUREX typically ranges from 7,000 to 10,000 gallons per minute.

The chemical sewer delivers the liquid effluent to the 216-A-3 (B Pond) surface pond located outside the 200 East Area fence line. Normally all of the discharge is routed to B Pond, however, a diversion capability to route the effluent stream to a concrete retention basin exists. The retention basin was designed to be used only if concentrations of radionuclides in the effluent stream exceed established limits. Recently, the retention basin has been occasionally used when the pH monitor indicates that the effluent is approaching levels that would designate it as a corrosive waste. The concrete retention basin permits limited plant operations until the cause of the upset has been corrected, and the stream returns to normal conditions. After sample analysis, elementary neutralization may be performed, if necessary, and the water will be released to B Pond. Other handling capabilities exist for radionuclides that are out of specification.

2.2 ENGINEERING OPTIONS

With increasing awareness of the effects of chemicals in the environment, attention is being focused on plant modifications and operating methods that will preclude the release of chemicals to the environment. The chemical sewer is the primary route by which chemicals have historically left the plant and have been discharged to ponds, along with large volumes of cooling water and steam condensate. All areas served by the chemical sewer require evaluation to determine the extent of modifications necessary. The extent of modifications in each area is largely dependent on the probability that chemicals can enter the chemical sewer. The amounts, in either volumetric or mass terms, has not been a significant factor in determining the extent of modifications required, since any release of a chemical has now been deemed unacceptable by PUREX management. Therefore, the scope of modifications required in each plant area is determined as the extent necessary to provide confidence that neither accidental or inadvertent operator actions will result in hazardous chemical releases to the chemical sewer. To the extent practical, pathways to the chemical sewer will be eliminated.

The aqueous make-up (AMU) area has the greatest potential for chemical releases. The AMU area distributes over twenty standard chemical process streams for use in the PUREX process. Occasionally, additional materials for decontamination flushes or special process operations are prepared and distributed. The PUREX process can require 200,000 gallons or more of aqueous chemical solutions per day, all of which are distributed from the AMU. Historically the majority of chemical releases from the AMU have resulted from AMU tank overflows on transfers from the 211-A bulk chemical storage tanks, north of the main building.

Modifications to the AMU area have, therefore, the highest priority, and are being addressed as indicated in the following subsections. Other areas of concern have also been identified and modifications are either being selected or planned. Implementation schedules for these modifications are stated only where technical approaches and design criteria and concepts have been resolved. Current plans for concluding engineering studies and evaluations of such areas are also presented to indicate when concept selections and implementation plans will be decided. This information is summarized in Table 1, shown in Section 2.3.

2.2.1 AMU Tank Overflow and Drain Collection

This modification reroutes the drain and overflow lines for all AMU make-up tanks to designated collection tanks in the basement of the AMU. The original plant design routed these lines directly to the chemical sewer, which has allowed occasional overflows and chemical disposals to reach the environment after dilution by cooling water and steam condensate in the chemical sewer and pond systems. This modification will break this direct pathway to the chemical sewer. Separation of incompatible chemicals will be achieved by routing them to separate collection tanks. Additional tanks will be provided to permit certain required segregations. Pipe routings and a pump will be provided to permit returning chemicals to an appropriate point where they can be reused as originally intended or substituted into an alternate, beneficial use within the plant.

An intensive engineering effort was required to evaluate the original system design and determine appropriate modifications. This included developing engineering drawings of the existing system to depict its design features and functions in a format that could be simplified, evaluated, and aid in decision making. Prior to this time, complete system drawings of the AMU have not existed in the level of detail required to analyze the situation for complete regulatory compliance. Once the existing design was documented as the present baseline configuration, criteria were established for the new functions and performance desired. The required modifications were then conceptualized as the changes necessary to satisfy the new functional and performance criteria. Preliminary design was begun in February 1986, to further develop the new concepts and establish schedule and funding requirements for the final, or "definitive," design and construction activities.

As currently planned, definitive design can begin by May and construction by October, 1986. This will permit construction completion and beneficial use of the modified AMU systems by February 28, 1987.

2.2.2 AMU Tank High Level Alarms and Interlocks

High level alarms have recently been installed in five AMU chemical make-up tanks, with accompanying indicator lights (annunciators) located on an annunciator panel in the central dispatcher's office, adjacent to the plant control room. This planned modification installs high level alarms in AMU tanks which do not already have them, and electrically operated shut-off valves on tank inlet lines. It also provides additional annunciator panels for each AMU floor and a summary floor alarm annunciator in the dispatcher's office.

Two alarms will be provided for each tank. The first alarm will activate when the tank reaches the 80 percent full level, and will serve as a warning to the operator. In the event the operator fails to take the necessary cated actions at the 80 percent level, a second alarm will activate at the 95 percent level. The second alarm will activate to shut the tank inlet valve, and prevent further filling which would otherwise result in an overflow at the 100 percent level. The 95 percent high level alarms will be indicated on their respective annunciator panels. Local tank indicator lights will also be provided for both the 80 percent and 95 percent alarms.

Preliminary design was begun in February 1986 to develop technical requirements and establish schedule and funding requirements. As currently planned, definitive design can begin by May and Construction by August 1986. This will permit construction completion and beneficial use by February 28, 1987.

2.2.3 AMU Waste Chemical Drum-Out

The chemical collection tanks discussed in Subsection 2.2.1, AMU Tank Overflow and Drain Collection, above, may occasionally receive residual and out-of-specification chemical batches from the primary AMU make-up tanks. Once transferred to the collection tanks, in the AMU basement level, analyses and evaluations will be performed to determine available options. Only after beneficial reuse and elementary neutralization have been determined to be unapplicable, will drum-out and repackaging for off-site disposal to a permitted facility be pursued. Once the contents of the tank have been declared a waste, existing solid waste disposal procedures will be followed that include transfer to the Non-Radioactive Dangerous Storage Facility. This modification provides a drum-out station in the AMU, where chemicals declared as waste can be safely transferred to DOT approved waste drums.

Preliminary design will begin by April 1986. As currently planned, definitive design and construction will be accomplished concurrently with AMU tank overflow and drain collection, to consolidate these efforts. This will result in a beneficial use date of February 28, 1987.

2.2.4 AMU Area Curbing

This modification provides concrete curbs around AMU tanks and pumps, to contain and segregate potential chemical leakages. This will minimize the spread of chemical leakage until they can be cleaned up, and prevent the inadvertent mixing of incompatible chemical leakages. Areas enclosed within curbs will be minimized to the extent practical, while providing satisfactory volume retention capacity. Routine operator surveillance will be sufficient to monitor for leakage and to take corrective actions. (Historically, tank and equipment leakage has been rare, and has not presented any significant problems.)

Concrete curbs will be formed in place on the existing AMU concrete floors, after surface preparations to ensure adequate bonding. These curbs may also be caulked and sealed with protective coatings to ensure easy and thorough clean up of chemical leakage. Sumps will not be provided, since each curbed area will be small enough for clean-out and decontamination by manual means.

Preliminary design to determine the general layout of the curbing will begin by September 1986, after other AMU tank and piping modification designs have been completed. Due to the relatively simple nature of curbing design and construction, both tasks can be completed by February 28, 1987.

2.2.5 211-A Chemical Storage Area Diking

This modification provides additional concrete diking around the 211-A outdoor chemical storage tanks, north of the plant's main building. Concrete floors will be poured inside the existing and new dikes to provide an impermeable secondary containment for potential tank overflows and leaks. Interior concrete surfaces will be painted to facilitate cleaning and decontamination where needed.

The areas to be enclosed contain tank overflow lines which currently lead directly to the chemical sewer. The chemical sewer lines will be permanently plugged or capped and sealed beneath the new concrete floors, to preclude access to the chemical sewer. The overflow lines will be modified to drain to the diked area. Collection sumps will be provided to facilitate pump-out and clean-out when needed.

An engineering study was concluded in March 1986, describing 211-A diking requirements. Because of the straight forward nature of the required work, design will begin by April 1986 with construction following in mid-summer. Construction is expected to be completed in October 1986, pending favorable weather.

2.2.6 Demineralizer Regenerant Neutralization

The PUREX plant uses large volumes of demineralized water, which is prepared locally by passing plant water through a dual base, cation and anion, set of demineralizer columns. The demineralizer system, however, requires periodic regeneration of its resin beds with sulfuric acid and sodium hydroxide. After use in regeneration, both regenerants must be disposed of as waste chemicals. Both regenerants have historically been routed directly to the chemical sewer, to mix with cooling water and steam condensate transferred to ponds. This practice has been discontinued because it would cause chemical sewer pH to exceed the regulatory limits for release to the environment.

This modification provides a demineralizer regenerant holding tank and elementary neutralization system, in which the sulfuric acid and sodium hydroxide discharges will be collected for mutual neutralization. Instrumentation including tank pH measurement will be provided to monitor the regenerants. Additional sulfuric acid or sodium hydroxide can be metered into the holding tank to make final pH adjustments if needed. An agitator will be provided to facilitate neutralization and mixing. Once neutralized, the regenerants will be released to the chemical sewer. The plant currently uses administrative control pH limits of 3 and 11.5, diverting the total chemical sewer flow to the retention basin when the pH approaches either limit.

An engineering study was completed in March 1986, which established the basic technical requirements for the permanent regenerant neutralization system. Development of functional design criteria and the conceptual (preliminary) design are planned for fiscal year (FY) 1987, followed by definitive design and construction in FY 1988. These additional project development steps are necessary to comply with federal project management and funding guidelines for capital upgrades of this magnitude. More detailed implementation planning is not possible at this time without completing the conceptual design, where the project schedule will be developed. Construction completion and beneficial use dates are, therefore, "to be determined" (TBD), but can be generally assumed to occur sometime in FY 1989.

An interim process test has been underway since February 1986, in which the timing and flow rates of both regenerants are coordinated to arrive in the discharge piping at the same time. The objective of this "co-regeneration" process test is to establish the control parameters for achieving self neutralization of the regenerant streams. This test has been successful in demonstrating the concept, but has yet to achieve complete success in maintaining the discharge pH within the plant's administrative control limits. However, since the start of this test, the duration of diversions to the retention basin has decreased. Most of the diversions now occur during the start or termination phases of co-regeneration, when regenerant flows are not stable. This test has been successful in reducing the

amount of regenerant diverted to the retention basin to about 6 percent to 12 percent of the total regenerant volume. The bulk of the regenerant stream is now well within the administrative control limits, and is released to the chemical sewer. This test will continue until satisfactory control parameters are established.

2.2.7 211-A Chemical Storage Tank High Level Alarms

High level alarms have previously been installed in five 211-A bulk chemical storage tanks. This modification provides high level alarms for the remaining tanks which do not have them.

Preliminary design began in March 1986. Definitive design and construction will occur concurrently with AMU Tank High Level Alarms and Interlocks, due to the similarity of this work. This will result in a beneficial use date of February 28, 1987.

2.2.8 211-A Area Miscellaneous Drain Collection

This modification provides drain collection systems for various chemical handling and pumping equipment and piping trenches in the 211-A area, outside the main plant building. This will include tank car and tank truck unloading stations, the 211-A pump house pumps and valves, and pipe trenches, and will preclude releases of spills or overflows to the environment.

This area is currently being studied to determine the most practical approach to take. This effort will conclude by September 1986, at which point the design concept and technical requirements will be determined. Subsequent implementation plans are dependent upon these determinations, and cannot be projected at this time.

2.2.9 Piping and Operating Gallery Tank High Level Alarms and Interlocks

The Piping and Operating (P&O) Gallery extends almost the full length of the PUREX plant, and contains utility and chemical transfer piping which supply chemical processes within the plant. The P&O Gallery contains five chemical tanks similar to the AMU tanks, and which require additional controls to preclude chemical overflows.

This modification installs high level alarms and inlet shut-off valves on the P&O Gallery five chemical tanks. Alarms will be provided for both the 80 percent and 95 percent tank levels, with an automatic activation of the inlet shut-off valve at the 95 percent level. Annunciation will occur both locally on each tank and on a P&O Gallery alarm annunciator panel, with a summary alarm in the dispatcher's office. The design concept for this system is the same as that used for the AMU tanks, as discussed in Subsection 2.2.2, AMU Tank High Level Alarms and Interlocks.

Preliminary design began in March 1986. Definitive design and construction will be concurrent with AMU Tank High Level Alarms and Interlocks, due to the similarity of the design concept. This will yield a beneficial use date of December 31, 1986.

2.2.10 Piping and Operating Gallery Spill Containment

Utility distribution and chemical transfer lines run along much of the length of the P&O gallery. Any leaks from these lines are presently collected by the floor drain collection system. Further study is required to specify a system to deal with potential chemical discharges from the P&O Gallery headers. A determination is to be made by September 1986.

2.2.11 U8 Overflow

Tank U8 is part of the nitric acid recovery system which collects dilute and radioactively contaminated nitric acid overhead steam from the vacuum acid fractionator, T-U6. At present, the only overflow route is into the cooling water discharged from U-cell, which makes up the greater part of the chemical sewer flow. Further study is planned to devise a means to prevent this overflow from being discharged into the chemical sewer. A determination is to be made by September 30, 1986.

2.2.12 Additional Collection and Treatment

Consideration is being given to future needs for a centralized collection and treatment facility or plant addition. Studies are underway to assess the need for such a facility, the functions and capabilities desired, and the appropriate timing for such an addition. The study is evaluating the needs for elementary neutralization or other treatments, chemical packaging for shipment, a centralized drum-out facility, additional storage, and waste volume reduction or concentration methods. If a facility permit is deemed necessary, planning and preparation will be identified in the study, which will be completed by September 30, 1986.

2.2.13 Continuing Studies and Investigations

Additional areas of concern have been identified which require evaluation as to potential contributions to chemical discharges, and means available to prevent such discharges. These areas include the following:

(1) Improvement of chemical sewer water purity.

(2) Dry chemical storage and handling in the AMU.

(3) Prevention of pump seal leaks.

(4) Thorough investigation of plant systems such as the chemical sewer for undiscovered potential sources of chemical discharges.

There will be a continuing, on-going search to identify other potential problem areas and to determine a solution to prevent environmental release.

2.3 INTEGRATED SCHEDULE

The planning and implementation of plant modifications is an extensively iterative process, requiring the coordination and balancing of many variables. These include finite budgetary constraints; design, procurement, and construction time requirements; engineering resource availability; and plant outages and other opportunities in which modifications can be installed. These and other variables must be carefully planned and managed to ensure effective plant modifications can be installed as early as possible.

Table 1, below, compiles the schedules for each PUREX modification discussed above. The first four tasks in Table 1 will resolve the AMU chemical management problems which led to the releases cited in the compliance order. The completion of these tasks already have the highest priority, however, as of this date funding and schedule details are still being resolved within the scheduled end dates. The Department of Energy reserves the right to modify and update this schedule as constraints dictate. In the event that changes become necessary, prior notification will be given to WDOE to permit negotiation and concurrence.

Table 1. PUREX CHEMICAL MANAGEMENT UPGRADES

	Description of Modification	Status of Planning	Beneficial Use Target Date
1.	AMU Tank Overflow and Drain Collection	Preliminary design underway March 1986. Definitive design to start by May 1986. Construction to start by October 1986.	February 28, 1987
2.	AMU Tank High Level Alarms and Interlocks	Preliminary design underway March 1986. Definitive design to start by May 1986. Construction to start by August 1986.	February 28, 1987
3.	AMU Waste Chemical Drum-Out	Preliminary design to start by April 1986. Definitive design and construction to be concurrent with Item 1, AMU Tank Overflow and Drain Collection, above.	February 28, 1987
4.	AMU Area Curbing	Preliminary design to start by Sept. 1986	February 28, 1987
5.	211-A Chemical Storage Area Diking	Engineering study completed March 1986. Design and construction activities to start by April 1986.	October 31, 1986
6.	Demineralizer Regenerant Neutralization		
	o Interim Co-regeneration	Co-regeneration process test underway February 1986. Will continue indefinitely.	To be determined (TBD)
	o Permanent System Upgrade	Engineering study completed March 1986. Functional design criteria and conceptual design planned in FY 1987. Design and construction planned to start in FY 1988.	TBD
7.	211-A Chemical Storage Tank High Level Alarms	Preliminary design underway March 1986. Definitive design and construction to be concurrent with Item 2, AMU Tank High Level Alarms and Interlocks, above.	February 28, 1987

ATTACHMENT 1

Table 1. PUREX CHEMICAL MANAGEMENT UPGRADES (cont.)

	Description of Modification	Status of Planning	Target Date
8.	211-A Area Miscellaneous Drain Collection	Under current evaluation.	TBD
9.	P&O Gallery Tank High Level Alarms	Preliminary design underway March 1986. Definitive design and construction to be concurrent with Item 2, AMU Tank High Level Alarms and Interlocks, above.	February 28, 1987
10.	P&O Gallery Spill Containment	Under current evaluation.	TBD
11.	U8 Overflow	Design change in planning. Schedule to be developed.	TBD
12.	Additional Collection and Treatment	Under current evaluation.	TBD
13.	Continuing Studies and Investigations	Underway and will continue indefinitely.	TBD

3.0 PLUTONIUM FINISHING PLANT

3.1 PLANT DESCRIPTION

The Plutonium Finishing Plant (PFP) is a multipurpose plutonium handling facility located in the 200 West Area. Operations conducted in the PFP include plutonium processing, reclamation (scrap recovery), shipping, receiving, handling, and repackaging. Analytical laboratories within the facility provide nondestructive assay (NDA) for safeguards and process measurements and provide actinide analytical capability. A research and engineering laboratory supports plutonium processing and actinide waste technology. Waste management practices at PFP include disposal of liquid waste to underground storage double shell tanks, cribs, and ditches, as well as disposal of solid waste to the radioactive burial grounds and offsite disposal of hazardous waste.

3.2 ENGINEERING OPTIONS

The Plutonium Finishing Plant has established administrative controls and engineered barriers to preclude the release of hazardous chemicals or hazardous waste to the environment. The floor drain systems of the aqueous make-up room sumps have been modified so tank overflows or piping leaks are contained for recycle/reuse, elementary neutralization, or disposal off-site to a permitted facility. Other engineered barriers in place include the installation of conductivity probes to detect tank overflows.

An engineering study in progress will identify areas within PFP that require improvement or modifications to further prevent hazardous chemicals from reaching the environment and is to be issued by the end of March 1986. Requirements have already been identified for additional liquid level alarm systems, automatic valve and pump shut-off systems, secondary containment for bulk storage tanks, and a collection system for all chemical sewer drains in the plant. Implementation plans are being developed and will be finalized by September 30, 1986.

4.0 U PLANT

4.1 PLANT DESCRIPTION

Although U Plant was one of the original fuels separations facilities constructed in the early 1940s to use the bismuth phosphate extraction process, it was never operated for that purpose. U Plant was, however, used to recover uranium from stored radioactive waste. This mission has now been completed, and U Plant is currently used for spare process equipment storage.

4.2 ENGINEERING OPTIONS

Evaluations and studies will be planned to further assess the need for plant modifications.

5.0 UO_3 PLANT

5.1 PLANT DESCRIPTION

The uranium oxide plant is located adjacent to U Plant in the 200 West Area, and is currently in operation producing powdered UO_3 by calcining uranyl nitrate hexahydrate (UNH) from PUREX. Several chemical reagents are used in this process, and have storage and distribution system designs typical of the 1940s. Steam condensate from this process, referred tp as Crpcess cpmdemsate, is currently routed to a crib in 200 West. The mission of the UO_3 Plant will parallel that of PUREX, beyond the year 2000.

5.2 ENGINEERING OPTIONS

Engineering studies are being planned to determine the extent of secondary containments and engineered barriers required for the chemical storage and handling areas. Lock and tag measures and liquid level alarms are providing adequate interim control. Although the UO_3 process condensate is a by-product stream as defined by the Atomic Energy Act of 1954, design is underway for a pH adjustment system using caustic addition. Installation, however, has not been scheduled as yet, but will be planned as the design progresses. The scheduled completion date for this installation will be established by September 30, 1986.

6.0 T PLANT

6.1 PLANT DESCRIPTION

The T Plant complex past mission was the separation of plutonium and uranium from spent reactor fuel using the bismuth phosphate separation process. In 1957 the plant was converted to a decontamination facility and a support facility for engineering development and other operations requiring radiological containment or isolation. It is presently used as a decontamination and repair facility for Hanford site contractors and as a spent fuel storage facility. T Plant uses a variety of decontamination methods which use hazardous chemicals.

6.2 ENGINEERING OPTIONS

T Plant has implemented administrative controls and lock and tag procedures to preclude the release of chemicals to the environment. Catch tanks have been installed for collection of pump and piping leaks. Piping and tank instrumentation upgrades are in progress and will be completed in FY 1986. A new chemical drum storage area with appropriate spill containment barriers is being constructed and will also be completed in FY 1986. Other planned upgrades during 1986 at T Plant include rerouting of all chemical sewer drain lines to a collection sump, providing secondary containment and surveillance instrumentation for the bulk chemical storage tanks (211-T area), and upgrade of piping systems in 211-T area. These upgrades are planned for completion by September 30, 1986.

7.0 B PLANT

7.1 PLANT DESCRIPTION

B Plant, located in the 200 East Area, is one of the original Hanford chemical separations plants and has completed its past mission of separating and encapsulating strontium and cesium. In preparation for projected new missions, B Plant is presently in a standby mode for scheduled maintenance and upgrades. The projected mission, scheduled to start in April 1987, will process PUREX neutralized zirconium acid waste (NZAW). Waste management practices at B Plant include disposal of radioactive liquid waste to double shell tanks, ponds, cribs, and ditches. Solid waste is disposed in the burial grounds or sent for offsite disposal.

7.2 ENGINEERING OPTIONS

B Plant has isolated its major chemicals and hazardous waste sources to preclude their release to the environment. Administrative controls and lock and tag of valves and drain valves have prevented release of chemicals to the chemical sewer. Corrosive waste is neutralized by elementary neutralization in the tanks or within the chemical sewer prior to discharge to the environment. Elementary neutralization is also used for treatment of the water demineralizer corrosive waste.

The status of B Plant with regard to dangerous waste regulations is being addressed and a priority list of 18 items has been prepared. This list will group the items in categories to be addressed immediately at the plant or for further consideration in engineering studies. Some of these engineering studies are already in progress. A follow-up report on the status and conclusions of this effort will be prepared by September 30, 1986.

Internal Letter **Rockwell International**

Date March 14, 1986 No. 65900-86-171 ATTACHMENT 2

TO: (Name, Organization, Internal Address)
Distribution

FROM: (Name, Organization, Internal Address, Phone)
J. C. Fulton, Manager
Process Engineering Dept.
2750-E/A203/200-E
3-1095

Subject: CHEMICAL SEWER MANAGEMENT

Ref: (a) Letter, February 15, 1985, J. F. Albaugh to Distribution, same subject
(b) Accident Prevention Standard No. 32, June 5, 1985, Rockwell Manual RHO-MA-221, Volume 1, "Accident Prevention Standards"

This letter supersedes reference (a) as the overview document for Chemical Sewer Management. Direction contained herein reflects recent contact among Department of Energy (DOE), Environmental Protection Agency (EPA), and Washington Department of Ecology (Ecology) personnel, and experience gained to date with regard to management of hazardous substances.

Rockwell Hanford Operations (Rockwell) has developed a Chemical Sewer Management System based upon Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations and the Washington Administrative Code (WAC) 173-303 Dangerous Waste Regulations. The exact form of the regulatory requirements will be negotiated over a period of several years. It is Rockwell's intent to modify Chemical Sewer Management Procedures toward full compliance with the Dangerous Waste Regulations. The applicable operating procedures, administrative guides, and/or desk instructions must be revised to reflect guidance provided in this letter. Changes to procedures must be completed and in place no later than March 31, 1986.

The following is a reiteration of previous chemical sewer management methods, incorporating all significant changes that have been adopted to date:

- Treatment of regulated chemicals is limited to the destruction of corrosive characteristics by means of elementary neutralization and by neutralization in a totally enclosed treatment facility (TETF). All other treatments require obtaining EPA permits.

- Discharge of nonradioactive chemicals to underground storage is only acceptable if the chemical is to be used for pH adjustment purposes or other beneficial use within the process, and only after concurrence with the Solid Waste Processing and Disposal (SWP&D) Unit. Discharge of other chemicals is a violation of state dangerous waste regulations.

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- o Discharge of regulated chemicals to the chemical sewer, including forced releases, is not allowed. Concurrent discharge of a corrosive chemical with a neutralizing agent to a TETF such as a chemical sewer pipe, may be pursued after study of mass and heat balance, and reaction kinetics unique to the discharge. Operation of a TETF discharge must meet regulatory criteria before consideration.

- o The regulatory status of a release must be verified by a member of the Solid Waste Processing and Disposal (SWP&D) Unit before telephone reports are initiated.

- o Telephone reports of releases of reportable quantities (RQ's) shall be initiated immediately after verification with SWP&D Unit personnel.

- o Reportable Quantities (RQ's) and Minimum Accountable Quantities (MAQ's):

  - Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) RQ's refer to the pounds of the pure chemical product released and not pounds of solution released.

  - Ecology RQ's refer to either the total pounds of solution released, or pounds of pure chemical product for those chemicals listed under WAC 173-303-9903.

  - The use of Minimum Accountable Quantities to determine the regulatory status of a solution based on its concentration applies to Ecology regulations only; CERCLA is not concentration-dependent.

- o A formula for the determination of the regulatory status of some mixtures has been incorporated in Figure I, List 3, to assist plant personnel.

- o Figures I and III, Charts I and II, and details in the general text have been revised.

- o In addition to initial SWP&D Unit verification of the regulatory status of a release or spill, the Regulatory Analysis Unit (RAU) will perform a second analysis as a crosscheck. The crosscheck is <u>not</u> needed as a prerequisite for initiating telephone reports.

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The general approach to Chemical Sewer Management, from which specific guidance is derived, may be summarized as follows:

- o In the event that plants have excess hazardous chemicals not suitable for use in the process, the following options must be considered, in the order listed:
  - Evaluate the chemicals for recycle/reuse within the plant or the Hanford Site.
  - Evaluate the chemicals for possible neutralization prior to discharge to the chemical sewer or within a TETF, if the chemicals are regulated only for their corrosive characteristics. Other chemicals, such as heavy metals, cannot be neutralized.
  - Evaluate collection of chemicals in 55-gallon drums for offsite treatment or disposal.
  - Evaluate discharge of the chemicals to underground storage (UGS), only if the chemicals are to be used for pH adjustment of radioactive waste or other beneficial use, and are normally used for that purpose in a different concentration.
- o Chemical Discharge History (CDH) information for all regulated chemical discharges is required and will be recorded in accordance with guidance provided in Item 4, below.
- o When spills that exceed an RQ occur, the CERCLA/Ecology reporting sequence described in Item 5, below, will be initiated.

Logic diagrams for the disposal decisions and reporting procedures, as outlined above, are provided on revised Charts I and II. Specific guidance regarding discharges, chemical disposal, and reporting procedures are provided in Items 1 through 5 (below) and in Figures I, II, and III. The specific guidance shall be included in plant-specific procedures and administative guides as appropriate.

1. PLANNED DISCHARGES

Planned discharges cannot proceed until the regulatory status of the substance has been determined, using Figure I. In the event that the concentration of the substance is below the MAQ and the pH is between 2 and 12.5, the substance is unregulated and may be drained to the chemical sewer without further consideration. The MAQ values on Lists 1, 2 and 3 can be used to compute the regulatory status of

pure chemicals, dilutions of single chemicals, and some mixtures. Lists 4 and 5 provide the regulatory status of standard batches and of operations (e.g., tank rinses) commonly performed in the plants. The regulatory status of off-specification batches and of chemicals not listed will be provided by Mr. R. R. Rodríguez on 3-4809. During off-shift hours and weekends, refer to the call list provided by the Process Engineering Department.

If the amount of the substance intended for discharge exceeds the MAQ value, the handling method selected will be as shown on Chart I. Assistance with treatment/benefit evaluations will be provided by the Analytical Process Development Unit (D. A. Dodd, 3-2154) or the SWP&D Unit (D. R. Groth, 3-4258).

2. UNPLANNED DISCHARGES

Unplanned discharges, above MAQ values, to the chemical sewer or TETF shall be reported using the reporting method prescribed in Item 4, and in Item 5 if that is also appropriate.

3. DISPOSAL OF CHEMICALS AND CHEMICAL CONTAINERS

Excess chemical materials, batch chemicals transferred to drums for disposal, regulated quantities of chemicals from spill cleanup efforts, and emptied chemical containers shall be transferred out of the facility within 90 days from the date when the waste was collected in the container, or the date when the container was emptied. All containers shall be disposed as prescribed by a Chemical Disposal Analysis. This analysis will be provided by the SWP&D Unit upon receipt of a Chemical Disposal Request from the generator. The analysis will provide a prescription for preparing these substances and containers for pickup and eventual disposal in accordance with their regulatory status. This process may be initiated by contacting Mr. R. R. Rodríguez on 3-4809, or Mrs. J. A. Reddick on 3-4733.

4. CHEMICAL DISCHARGE HISTORY

Chemical discharges and spills exceeding MAQ concentrations must be tracked to satisfy Ecology reporting requirements. Data will be gathered by the plants and laboratories on a monthly basis, and the data from all sources will be compiled by the SWP&D Unit to generate a monthly report for submittal to the Department of Energy - Richland Operations Office (DOE-RL). The data will be recorded on a Chemical Discharge History (CDH) data sheet, and must be received by the SWP&D Unit by the third day after the end of each calendar month. A completed CDH must be sent to the SWP&D Unit, even if there were no discharges during the month to assure the auditability of files. Refer to Figure IV for an example of CDH usage.

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The CDH data sheet (Figure II) shall be maintained as follows:

- o The identity of the plant or laboratory should be typed in before incorporation into the procedure.
- o Identify the month and year. Data gathered shall be for a single calendar month.
- o Enter origin of release, such as from a vehicle, leaking drum, pipeline, or a numbered tank, pump, or valve.
- o Enter time and date of actual release.
- o Enter common name of mixture, batch or material.
- o Enter reason for discharge, such as a leak, overflow, drain prior to pump repair, spill, discharge of heel, or rinsing of tank.
- o Enter total volume discharged (in gallons) and weight or specific gravity.
- o Enter names of chemicals and their weight percent in the solution.
- o Enter computed (or known) weight of each chemical constituent.
- o Enter identity of sewer to which discharged or location of spill.
- o The initials of the appropriate Operations and Process Engineering Group managers will indicate acknowledgement of the discharge.
- o Designations will be entered by the SWP&D Unit during end-of-month compilation.

The CDH information is required for substances listed on Figure I, Lists 1 and 2. As shown on Chart II, chemicals and chemical mixtures not provided with MAQ values on Figure I will be identified by the SWP&D Unit by calling Mr. R. R. Rodríguez on 3-4809. During off-shift hours and weekends, refer to the call list provided by the Process Engineering Department.

5. CERCLA/ECOLOGY REPORTING PROCEDURES

In the event that a chemical release exceeds the CERCLA or Ecology RQ amount, data regarding the release will be compiled on the CERCLA/Ecology Hazardous Substance Release Report and telephone notifications made immediately upon determination that a release is reportable. Contact either Mr. D. R. Groth (3-4258) or Mr. R. R. Rodríguez (3-4809) to verify or evaluate the regulatory status of the release. During off-shift hours and weekends, refer to the call list provided by the Process Engineering Department. The release report, provided as Figure III, will be prepared as follows:

- o Copy information regarding substance name, composition, weight percent of constituents, and specific gravity or weight directly from the CDH sheet. Add other information that may be available to characterize the nature of the release.
- o Enter name of facility and location of release.
- o Enter quantity of release and exact point (e.g., tank number) of release.
- o Enter cause (e.g., spill, overflow, pump leak).
- o Enter time, date, and duration of release.
- o Enter location that spill has drained to (e.g., CSL, 216-Z-20).
- o Enter extent of injuries, damage, and approximate value of chemicals lost.
- o Describe immediate corrective actions (e.g., lock and tag of valve, repairs). Indicate whether an Off-Normal or Unusual Occurrence report (reference (b)) is being initiated.
- o Describe long-term actions that could or will be needed to prevent similar events in the future (e.g., procedural changes, equipment modifications).
- o Provide name and telephone number of person delegated the responsibility to obtain and provide additional information that will be required.

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- Contact Mr. D. R. Groth (3-4258) or Mr. R. R. Rodriguez (3-4809) of the SWP&D Unit to verify the regulatory status of the release. During off-shift hours and weekends refer to the call list provided by the Process Engineering Department. Official verification of regulatory status will be provided to the plants from the Environmental Control Program Office.

- Facility Management shall initiate telephone contact immediately with the following Rockwell personnel, and record time and date of contact on the release report:

Number	Name	Organization
3-4258	D. R. Groth	SWP&D Unit, Process Engineering Dept.
3-4981	L. L. Powers	Hazardous Waste Management Program
3-2874	R. A. Kaldor	Regulatory Analysis Unit, S&OA
--	--	Plant Manager
--	--	Plant Program Manager

- Facility Management shall then initiate telephone contact with the DOE-RL Environment, Safety and Health (ES&H) Duty Officer, and record time and date of contact on the release report. Although the officer on duty and the telephone number change weekly, the correct telephone number can be obtained from the Hanford Patrol Operations Center on 3-3800. The DOE-RL will notify the appropriate federal and/or state authorities within 24 hours of the spill or release.

- Transmit original copy of report to the Manager, SWP&D Unit, 2750-E/A105/200-E, and transmit copies of the report to all Rockwell personnel listed, within two days. The Safety and Quality Assurance Director and the Hazardous Waste Program Manager will submit written notification to DOE-RL within ten days of the release.

Your support of this effort is necessary in order for Rockwell to meet environmental protection commitments to the DOE and Ecology. Failure to correctly identify, promptly report, or make reasonable efforts to prevent the release of regulated chemicals will have detrimental effects upon DOE's negotiating position and legal liabilities.

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Further information and assistance will be provided by contacting either Mr. R. R. Rodríguez on 3-4809 or Mr. D. R. Groth on 3-4258.

J. C. Fulton, Manager
Process Engineering Department

JCF/DRG:bjb

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R. D. Prosser, Director
Waste Management

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ATTACHMENT 2

FIGURE I

REPORTABLE AND ACCOUNTABLE QUANTITY CHART

Any release of substances identified on Lists 1, 2, 3, or 4, will be recorded on the Chemical Discharge History (CDH) report sheet if the amount of the release equals or exceeds the Mimimum Accountable Quantity (MAQ) provided for that substance. In addition to being recorded on the CDH, any release exceeding the CERCLA or Ecology Reportable Quantity (RQ) provided for that substance will be reported by telephone and on the CERCLA/Ecology Hazardous Substance Release Report.

List 1. Toxic, Dangerous and Extremely Hazardous Substances

SUBSTANCE	CERCLA RQ*	ECOLOGY RQ**	MAQ***
Hydrazine	1 pound	2.2 pounds	A
Cadmium nitrate	1 pound	2.2 pounds	A
Hydrofluoric acid	100 pounds	400 pounds	A
Carbon tetrachloride	5000 pounds	2.2 pounds	A
1,1,1-Trichloroethane	1000 pounds	2.2 pounds	A
Potassium permanganate	100 pounds	400 pounds	B,D
Ammonium fluoride-ammonium nitrate (AFAN)	100 pounds	400 pounds	B,D
Tributylphosphate (TBP)	Unregulated	400 pounds	B,F
Ethylenediamine triacetic acid (EDTA)	5000 pounds	400 pounds	B,F
Trisodium hydroxyethyl ethylene diamine triacetate (HEDTA)	Unregulated	400 pounds	B,F
Liquid Ammonia	100 pounds	400 pounds	B,E
Sodium carbonate	Unregulated	Unregulated	-
Sodium nitrate	100 pounds	400 pounds	B
Sodium nitrate (solutions)	Unregulated	Unregulated	-
Sodium nitrite	100 pounds	400 pounds	B,D
Acetone	5000 pounds	400 pounds	A
Aluminum nitrate nonahydrate (ANN)	Unregulated	400 pounds	E
Hydroxylamine nitrate (HN)	100 pounds	400 pounds	E
Ferrous sulfamate	100 pounds	400 pounds	G
Trisodium phosphate (TSP)	5000 pounds	400 pounds	B,F
Hydrogen peroxide	100 pounds	400 pounds	B,D
Sodium bicarbonate	Unregulated	400 pounds	B,F
Sodium fluoride	1000 pounds	400 pounds	B,E
Sodium sulfate	Unregulated	Unregulated	-
Potassium nitrate	100 pounds	400 pounds	B
Potassium nitrate (solutions)	Unregulated	Unregulated	-
Ferric nitrate	1000 pounds	400 pounds	B,E
Rare earth nitrate	Unregulated	400 pounds	F

FIGURE I (continued)

List 1. Toxic, Dangerous and Extremely Hazardous Substances (continued)

---

*CERCLA RQ is for the total pounds of the pure chemical product, not of solution.

**ECOLOGY RQ is for the total pounds of solution.

***MAQ is defined as:

A: All quantities, regardless of form or concentration.

B: All quantities, when substance is in undiluted form.

C: A weight of 0.4 pounds (approximately 181 grams) in undiluted form.

D: If in solution, all quantities in a concentration of or exceeding 0.1 wt%.

E: If in solution, all quantities in a concentration of or exceeding 1.0 wt%.

F: If in solution, all quantities in a concentration of or exceeding 10.0 wt%.

G: If in solution, all quantities with a pH equal to or less than 2.

H: If in solution, all quantities with a pH equal to or greater than 12.5.

List 2. Corrosive Substances

NOTE: The RO value for a corrosive waste (below pH 2 or above pH 12.5) takes precedence over the RO value of the specific substance. The flush of an AMU tank is reportable if the resulting rinsate is a corrosive waste.

SUBSTANCE	CERCLA RO	ECOLOGY RO	MAO
Nitric acid	1000 pounds	400 pounds	G,E
Sodium hydroxide	1000 pounds	400 pounds	H,E
Sulfamic acid	100 pounds*	400 pounds	G
Sulfuric acid	1000 pounds	400 pounds	G,E
Phosphoric acid	5000 pounds	400 pounds	G,F
Potassium hydroxide	1000 pounds	400 pounds	H,E
Oxalic acid	100 pounds*	400 pounds	G,E
Hydrofluoric acid	100 pounds	400 pounds	B,D,G
Hydrochloric acid	5000 pounds	400 pounds	F,G
Any waste solution not specified above, or of unknown constituents, with pH below or equal to 2.0	100 pounds	400 pounds	G
Any waste solution not specified above, or of unknown constituents, with pH equal to above 12.5	100 pounds	400 pounds	H

*Based on pH considerations (pH below 2).

List 3. Toxic, Dangerous and Extremely Hazardous Substances Mixtures

The MAO values provided in Lists 1 and 2 refer to the pure chemical products or solutions with only one chemical in water. In order to determine the regulatory status of a chemical mixture of two or more chemicals in water, an equivalent concentration (EC) must be calculated. The EC is calculated as follows:

$$EC = \frac{W\%D}{100} + \frac{W\%E}{1000} + \frac{W\%F}{10,000}$$

where W%D, W%E, and W%F are the weight percent of the mixture components that have a MAO designation of D, E, or F.

If the EC is below 0.001%, the mixture is below its MAQ and is not regulated.

Example:

MIXTURE	COMPOSITION	MAO
HEDTA	10.0%	F
Sodium nitrite	2.5%	D
Sodium carbonate	5.0%	-
Water	82.5%	-

$$EC = \frac{2.5}{100} + \frac{0}{1000} + \frac{10}{10,000} = 0.026\%$$

EC exceeds 0.001% and this is, therefore, a Regulated Mixture.

The SWP&D Unit will provide regulatory information for mixtures that contain chemicals with MAO designations other than D, E, or F.

List 4. Precalculated Compositions For CDH Reporting Purposes

NOTE: The SWP&D Unit will provide plant-specific information regarding amounts to report for potential plant operational events. This is provided both to assist plant personnel and to establish uniformity of the auditable data base. The following example illustrates the purpose of this list:

BATCH NAME	ORIGIN	REASON FOR RELEASE	TOTAL VOLUME	COMPOSITION AND WT%	COMPOSITION POUNDS
Pu Precipitation	TK-N35, TK-N36	Heel Disposal	17 gal. of batch	Oxalic Acid: 10.15% H_2O: balance	12.8 lbs acid + N/A lbs H_2O

List 5. Precalculated Exclusions From CDH Reporting Requirements

NOTE: The SWP&D Unit will provide plant-specific information regarding substances or potential plant operational events which need not be considered for reporting purposes. This is provided both to save time for plant personnel and maintain consistency of records by establishing that which is non-reportable. The following examples illustrate the purpose of this list:

BATCH NAME	ORIGIN	REASON FOR RELEASE	TOTAL VOLUME	COMPOSITION AND WT%	COMPOSITION POUNDS
Column Flush	TK-105	Rinse Tank of batch film.	1.57 gal orig batch + 125 gal H_2O.	HNO_3: 0.0012% in rinse soln + H_2O: balance. EC under 0.001.	1.33 lbs of 100% acid + N/A lbs H_2O.
Tank Farm	TK-105	Rinse tank of batch film.	1.5 gal orig batch + 125 gal H_2O.	$NaNO_2$: 0.076% in rinse soln + H_2O: balance. EC under 0.001.	0.79 lbs of 100% $NaNO_2$ + N/A lbs H_2O.

FIGURE II

CHEMICAL SEWER DISCHARGE HISTORY

PLANT/LABORATORY ____________________ MONTH/YEAR ____________________

ORIGIN (TANK)	DATE/ TIME	BATCH NAME	REASON FOR DISCHARGE	TOTAL VOLUME (GAL)	COMPOSITION: CHEM. NAMES AND Wt.%	COMPOSITION: POUNDS OF EACH CHEM.	SYSTEM TO WHICH DISCHARGED	APPROVALS PLANT OPER.	APPROVALS PLANT PE Gp.	SWP&DU SUPPLIED DESIGNATION

Document No. | Rev/Mod | Page ____

BD-6400-083.2 (R-8-82)

ATTACHMENT 2

FIGURE III

CERCLA/ECOLOGY HAZARDOUS SUBSTANCE RELEASE REPORT

Substance Characterization, Including Name, Composition, % Wt., Sp.G, and RQ:

Facility and Location:

Quantity and Source:

Cause:

Time, Date and Duration of Release:

Location That Spill Has Drained To:

Injuries or Property Damage:

Immediate Corrective Actions and Recommended Long-Term Actions:

For Additional Information, Contact:

SWP&D Unit Verification Obtained From:

Telephone Contacts, Time and Date:

L. L. Powers	3-4981	______.	DOE-RL ES&H Duty Officer	6-____	______.
D. R. Groth	3-4258	______.	Plant Manager	3-____	______.
R. A. Kaldor	3-2874	______.	Plant Program Manager	3-____	______.

Signatures and Date:

Shift Support Manager	Date	Shift Manager	Date
Plant Manager	Date	Proc. Eng. Group Mgr.	Date

NOTE: This is an auditable report. Send original to:
Manager, Solid Waste Processing and Disposal Unit,
2750-E/A105/200-E.

FIGURE IV

CHEMICAL DISCHARGE HISTORY

PLANT PUREX   MONTH/YEAR January 1985

ORIGIN (TANK)	DATE/ TIME	BATCH NAME	REASON FOR DISCHARGE	TOTAL VOLUME (GAL. & WT.)	COMPOSITION: CHEM. NAMES AND WT.%	COMPOSITION: POUNDS OF EACH CHEM.	SYSTEM TO WHICH DISCHARGED	APPROVALS PLANT OPER.	PLANT PE OP.	SWP & DU SUPPLIED DESIGNATION
PUREX TK-214	1/16/85 0800	2BX	LEAK THROUGH TK-105 DRAIN	763 GAL. 6150 LBS.	1.54 WT% HYDROXYLA-MINE NITRATE 0.37 WT% HYDRAZINE 1.875 WT% NITRIC ACID	108 LBS. HYDROXYLA-MINE NITRATE 30 LBS. HYDRAZINE 68 LBS. (67%) NITRIC ACID	CHEMICAL SEWER			
PUREX TK-222	1/18/85 1300	STOCK MAT'L	TK L-8A OVERFLOW: VALVE #136 OPEN TO TK L-8A	948 GAL. 14,816 LBS.	67% NITRIC ACID	12,898 LBS. NITRIC ACID (67%)	CHEMICAL SEWER			
PUREX TK-200	1/12/85 1200	1BX	OUT OF SPECIFICATION	1,861 GAL. 18,617 LBS.	1.76 WT% NITRIC ACID 0.22 WT% FERROUS SULFAMATE 0.34 WT% SULFAMIC ACID	340 LBS. NITRIC ACID 43 LBS. FERROUS SULFAMATE 68 LBS. SULFAMIC ACID	CHEMICAL SEWER			

CHART I
RELEASE AVOIDANCE METHODOLOGY

This chart portrays the steps taken to determine the disposition of a substance identified as a nonradioactive waste which is not economical to reuse or recycle.

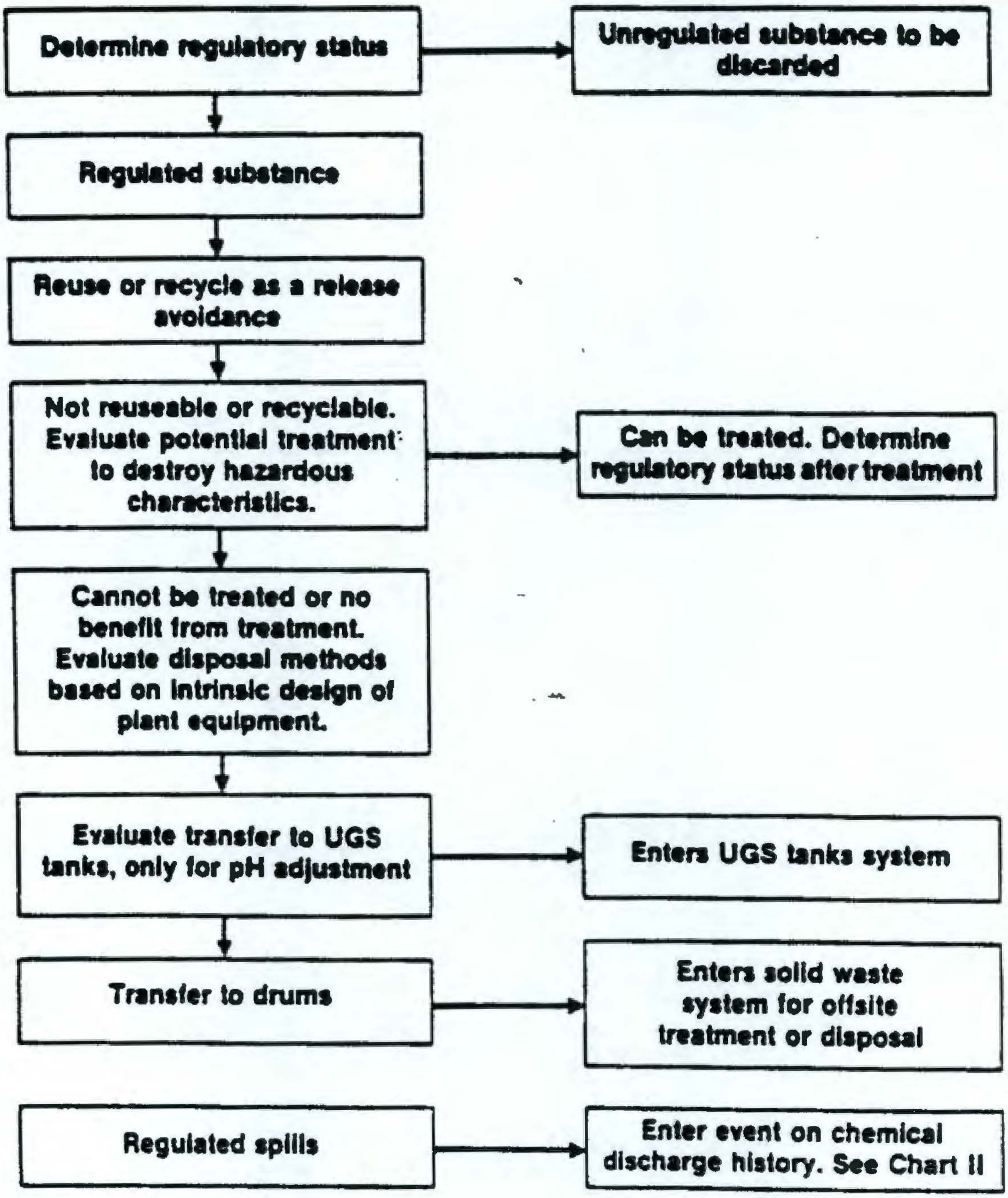

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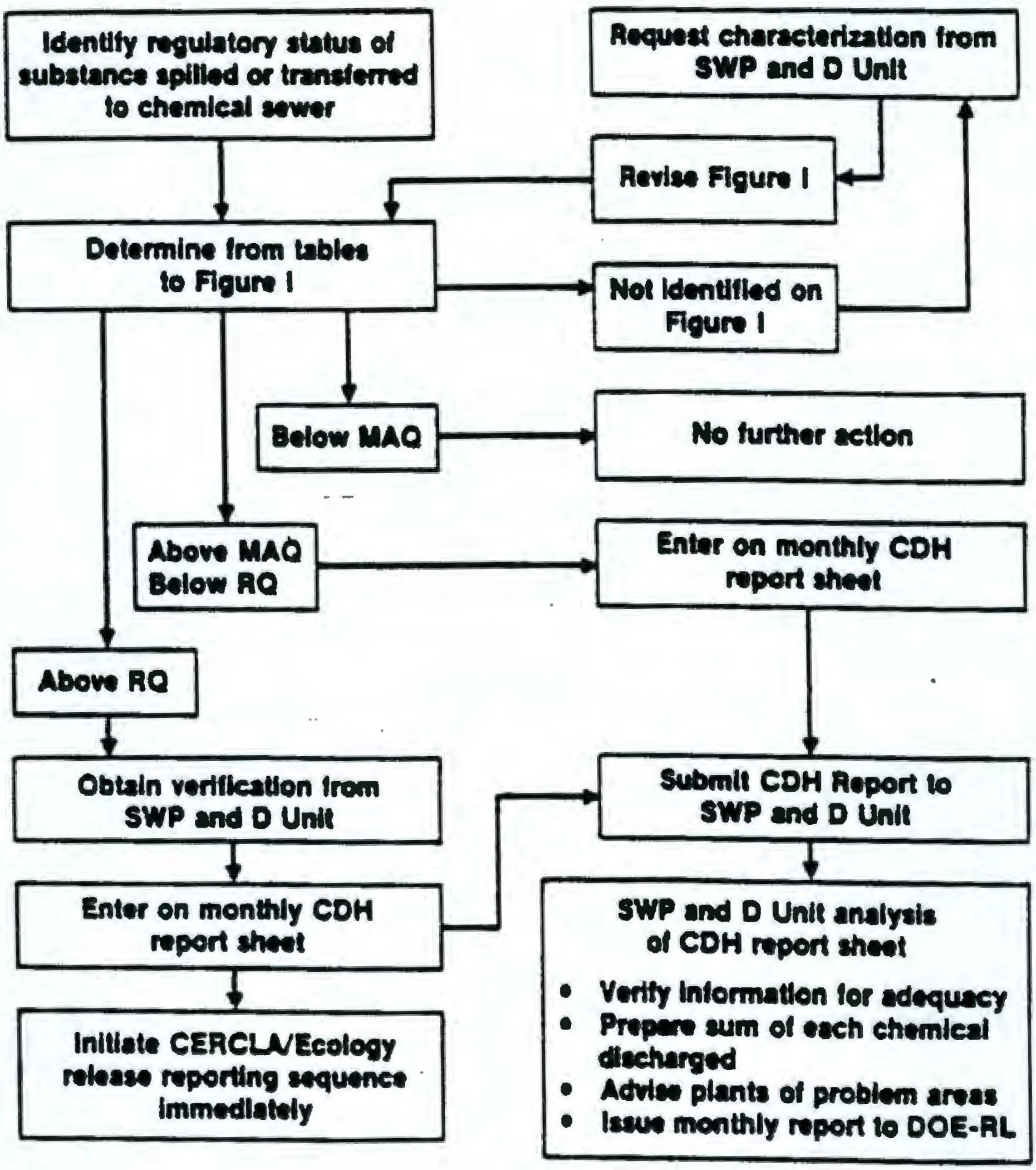
CHART II
TRACKING AND REPORTING SYSTEM

This chart portrays the steps taken to identify discharges of regulated substances and to prescribe remedial steps and prepare required reports.



process engineering

PLANT COMPLIANCE

WITH

CHEMICAL RELEASE REGULATIONS

ATTACHMENT 3

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Rockwell Hanford Operations

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APPROACH TO REGULATORY COMPLIANCE IMPLEMENTATION

- IDENTIFY CURRENT SOURCES, CONTROLS, AND BARRIERS.
- DETERMINE EFFECTIVE CONTROL AND BARRIER SYSTEM.
- DETERMINE COST.
- LOCATE FUNDING.
- COMMITMENTS, SCHEDULING AND TRACKING.

ATTACHMENT 3

PLANT SOURCES

PUREX

- AMU TANK DRAINS, TANK OVERFLOW, FLOOR DRAINS.
- 211-AREA TANK DRAINS, OVERFLOW, AREA DRAINS.
- DEMINERALIZER.
- UNDIKED TRUCK AND RAIL TRANSFER AREA.
- P&O GALLERY DRAINS (MAINTENANCE).
- PDD DISCHARGE FROM CONCENTRATORS.

B PLANT

- AMU TANK DRAINS, TANK OVERFLOWS, FLOOR DRAINS.
- 211-AREA TANK DRAINS, OVERFLOWS, AREA DRAINS.
- DEMINERALIZER.
- CHEMICAL HEADER DRAINS.

ATTACHMENT 3

PLANT SOURCES (CONTINUED)

PFP

- o PRF CHEMICAL PREPARATION AREA.
- o RMC LINE CHEMICAL PREPARATION AREA.
- o BULK CHEMICAL STORAGE AREA.

U PLANT

- o HNO_3 211-U AREA STORAGE TANKS.
- o H_2SO_4 AMU TANK TK-D-12.
- o H_2SO_4 STORAGE TK-331-U.
- o PROCESS CONDENSATE TO U-12 CRIB.

S PLANT

- o BULK CHEMICAL STORAGE TANKS.
- o LABORATORY SINKS.

ATTACHMENT 3

PLANT SOURCES (CONTINUED)

T PLANT

- AMU TANKS.
- 211-T CHEMICAL STORAGE AREA.
- 271-T FLOOR DRAINS.

ALL OTHERS

- 2101-M LABORATORY SINKS.
- 2703-E LABORATORY FLOOR DRAINS.
- FABRICATION SHOPS.
- POWERHOUSES AMU ROOMS.
- CHEMICAL TANK TRUCK.

ATTACHMENT 3

process engineering

CURRENT RELEASE PREVENTION BARRIERS

PUREX	SHORT TERM	LONG TERM
o AMU TANK DRAINS (31 TANKS IN SERVICE, 24 WITH SINGLE DRAIN VALVES), AND AMU ROOM FLOOR DRAINS	ADMINISTRATIVE CONTROLS FOR DISPOSAL IN PROCEDURE PO-020-220. METHODS TO DRAIN REGULATED CHEMICALS TO SEWER DELETED FROM ALL PROCEDURES. SELECTED DRAINS LOCKED AND TAGGED OR BLANKED.	RELEASE CONTAINMENT SYSTEM: ENG STUDY ECD: 1/86. FDC/CDR TO FOLLOW. DESIGN/CONSTRUCT TO START LATE FY 1986. ESTIMATED COMPLETE FY 1987. ESTIMATED COST: $600K
o AMU TANK OVERFLOW LINES	LIQUID LEVEL ALARMS SYSTEM FOR KEY TANKS: ECD: 1/86.	SAME AS ABOVE.
o 211-A AREA TANK OVERFLOW LINES	LIQUID LEVEL ALARM SYSTEM: ECD: 1/86	SAME AS ABOVE.
o 211-A TANK AND AREA DRAINS	ADMINISTRATIVE CONTROLS INCLUDE MATERIAL BALANCE. PROCEDURES DO NOT ALLOW DRAINAGE OF REGULATED AMOUNTS OF CHEMICALS TO SEWER.	211-A AREA CONTAINMENT BARRIER. ESTIMATED COST: $150K. (CAPITAL WORK ORDER)

ATTACHMENT 3

CURRENT RELEASE PREVENTION BARRIERS (CONTINUED)

PURTEX (CONT'D)	SHORT TERM	LONG TERM
o DEMINERALIZER (RECENT SAMPLE INDICATES RELEASES WITHIN LIMITS.)	o INSTALL pH METER CALIBRATION PIPING TO MONITOR RELEASES: ECD: 1/86 o INSTALL MONITOR TO REDUCE REGENERATIONS: DESIGN ECD: 1/31/86 INSTALL ECD: 4/31/86	DEMINERALIZER REGENERATION NEUTRALIZATION SYSTEM: UNFUNDED ENG. STUDY ECD: 1/86. MAY COMBINE WITH ABOVE SYSTEM, OTHERWISE FY-88 GPP POSSIBLE). ESTIMATED COST: $400K.
o TRUCK AND RAILCAR TRANSFER AREA	ADMINISTRATIVE CONTROLS SAME AS 211 AREA.	DIKING IN 211-A AREA WILL CONTAIN SPILLS - SEE ABOVE.
o P&O GALLERY DRAINS	ADMINISTRATIVE CONTROLS SAME AS AMU ROOM.	STUDY INCLUDING THESE DRAINS IN THE AMU RELEASE CONTAINMENT SYSTEM.
o PDD DISCHARGE FROM CONCENTRATORS (BYPRODUCT STREAM)	INSTALL INTERIM NEUTRALIZATION SYSTEM: DESIGN ECD: 1/31/86 INSTALL ECD: 3/31/86.	PERMANENT NEUTRALIZATION SYSTEM: UNFUNDED. POTENTIAL FY-88 GPP. ESTIMATED COST: $650K. ENG. STUDY FUNDED. ECD (STUDY): LATE FY-86.

ATTACHMENT 3

CURRENT RELEASE PREVENTION BARRIERS (CONTINUED)

B PLANT	SHORT TERM	LONG TERM
o PROCESS AND AMU TANK DRAIN LINES (CORROSIVE WASTE)	CORROSIVE WASTE IS NEUTRALIZED BEFORE RELEASE: START DATE: 9/84 COMPLETE DATE: ONGOING	ENGINEERING STUDY IN PROGRESS.
o PROCESS AND AMU TANKS OVERFLOW LINES (OTHER THAN CORROSIVE WASTE)	o LEVEL ALARMS - AMU TANKS. o INSTALL LIQUID LEVEL ALARMS IN SCALE TANKS: CURRENTLY UNFUNDED. ESTIMATED COST: $250K.	PROVIDE CONTAINMENT FOR OVERFLOWS: CURRENTLY UNFUNDED. ESTIMATED COST: $250K.
o AMU FLOOR DRAINS	ADMINISTRATIVE CONTROLS INCLUDE OPTION OF DIVERSION TO TK 10-1 PER BO-001-016.	REROUTE PIPING TO A COLLECTION TANK OR BASIN: CURRENTLY UNFUNDED. ESTIMATED COST: $250K.
o 211-B CHEMICAL STORAGE AREA	o DOUBLE BARRIERS AND LOCK-AND-TAG PROCEDURE: COMPLETED: 10/84. o INSTRUMENTATION UPGRADE: CURRENTLY UNFUNDED. ESTIMATED COST: $250K.	PROVIDE SECONDARY CONTAINMENT AROUND TANKS: CURRENTLY UNFUNDED. ESTIMATED COST: $200K.

ATTACHMENT 3

CURRENT RELEASE PREVENTION BARRIERS (CONTINUED)

B PLANT (CONT'D)	SHORT TERM	LONG TERM
o CHEMICAL HEADER DRAINS	SINGLE BARRIER AND LOCK-AND-TAG PROCEDURE: COMPLETED: 10/84.	SAME AS AMU FLOOR DRAINS.
o DEMINERALIZER UNIT	INSTALL pH BUFFERING SYSTEM: START DATE: 10/85 ECD: 12/31/85 ESTIMATED COST: $28K.	NONE NEEDED.
PFP		
o PRF CHEMICAL PREPARATION AREA (17 TANKS)	o ADMINISTRATIVE CONTROLS DESIGNED FOR RELEASE AVOIDENCE. PROCEDURES DO NOT ALLOW DRAINAGE OF CHEMICALS TO SEWERS. o CONDUCTIVITY PROBE AND ALARM TO MITIGATE IMPACT OF RELEASE: COMPLETED: 10/85 COST: $11K.	EVALUATE APPLICABILITY OR NEED FOR SECONDARY CONTAINMENT: START DATE: 5/86 ECD: 11/86 ESTIMATED COST: $34K.

ATTACHMENT 3

CURRENT RELEASE PREVENTION BARRIERS (CONTINUED)

PFP (CONT'D)	SHORT TERM	LONG TERM
PRF CHEMICAL PREPARATIONS AREA (CONTINUED)		DESIGN SECONDARY CONTAINMENT SYSTEM: START DATE: 11/86 ECD: 3/87 ESTIMATED COST: $6K. CONSTRUCTION OF SECONDARY CONTAINMENT SYSTEM: START DATE: 4/87 ECD: 10/87. ESTIMATED COST: UNDETERMINED.
o RMC CHEMICAL PREPARATIONS AREA (8 TANKS)	o PROVIDE SECONDARY CONTAINMENT: COMPLETED: 7/85 COST: $1K.	NONE NEEDED.
	o PROVIDE LIQUID LEVEL ALARMS: START DATE: 10/85 ECD: 2/21/86.	NONE NEEDED.

ATTACHMENT 3

CURRENT RELEASE PREVENTION BARRIERS (CONTINUED)

PFP (CONT'D)	SHORT TERM	LONG TERM
o FRONTSIDE LAB DRAINS	o PROCEDURES PROVIDED FOR NEUTRALIZATION OF CORROSIVES. GENERAL ADMINISTRATIVE CONTROLS IN SECTION 056 OF RHO-MA-273.	NONE NEEDED.

ATTACHMENT 3

CURRENT RELEASE PREVENTION BARRIERS (CONTINUED)

PFP (CONT'D)	SHORT TERM	LONG TERM
RMC CHEMICAL PREPARATIONS AREA (8 TANKS) (CONTINUED)	o DESIGN AUTOMATIC SHUTOFF SYSTEMS TO PREVENT HNO_3 AND ANN OVERFLOWS: START DATE: 1/86 ECD: 3/86 ESTIMATED COST: $6K.	NONE NEEDED.
	o INSTALL AUTOMATIC SHUTOFF SYSTEMS: START DATE: 3/86 ECD: 6/86 ESTIMATED COST: $8K.	NONE NEEDED.
o TK-D-9 NAOH STORAGE TANK	NO CONNECTION TO SEWER SYSTEM. NO ACTION RECOMMENDED.	STUDY ADEQUACY OF EXISTING SUMP TO CONTAIN A CREDIBLE SPILL: START DATE: 5-86 ECD: 9-86 ESTIMATED COST: $6K.
o HNO_3 STORAGE TANK	SAME AS ABOVE.	SAME AS ABOVE.
o ANN STORAGE TANK	SAME AS ABOVE.	SAME AS ABOVE.

ATTACHMENT 3

CURRENT RELEASE PREVENTION BARRIERS (CONTINUED)

S PLANT	SHORT TERM	LONG TERM
o HNO_3 STORAGE TANK	SUMP AND FLOAT TYPE LEVEL INDICATOR MONITORING.	ENGINEERING STUDY REQUIRED TO DETERMINE BARRIERS. CURRENTLY UNFUNDED.
o NaOH STORAGE TANK	SUMP AND DIP-TUBE LEVEL INDICATOR MONITORING. RETENTION BASINS ARE BARRIERS.	ENGINEERING STUDY TO BE COMPLETED JUNE 1986. CAPITAL UPGRADE TO BE COMPLETED FY-88.
o LABORATORY SINKS	COLLECTION VESSELS PROVIDED FOR REGULATED CHEMICALS.	NONE NEEDED.
T PLANT		
o 271-T AMU TANKS	ADMINISTRATIVE CONTROLS. DRAIN VALVES LOCKED, DRAIN PIPES CAPPED. CATCH PANS UNDER PUMPS. INSTALL WEIGHT FACTOR INSTRUMENTATION WITH AUTOMATIC PUMP SHUTOFF SWITCHES: START DATE: IN PROGRESS; TO BE COMPLETED: 3/6/86.	REROUTE DRAIN TO MODIFIED SUMP: START DATE: 1/15/86; ESTIMATED COST: $22K. (SUBMITTED FOR FUNDING)

ATTACHMENT 3

CURRENT RELEASE PREVENTION BARRIERS (CONTINUED)

T PLANT (CONT'D)	SHORT TERM	LONG TERM
o 211-T STORAGE TANKS AREA	NO BARRIERS. LOCK/TAG. ADMINISTRATIVE CONTROL OF LIQUID LEVEL.	o PROVIDE A DIKE FOR SECONDARY CONTAINMENT: START DATE: 4/15/86 ESTIMATED COST: $52K. (SUBMITTED FOR FUNDING) o INSTALL LIQUID LEVEL INDICATORS: START DATE: 6/15/86 ESTIMATED COST: $65K. (SUBMITTED FOR FUNDING)
o 221-T FLOOR DRAINS	NO BARRIERS. ADMINISTRATIVE CONTROLS PROVIDED IN PROCEDURE DO-120-023.	REROUTE FLOOR DRAINS TO 271-T SUMP: START DATE: 2/15/86 ESTIMATED COST: $104K. (SUBMITTED FOR FUNDING)
o 271-T FLOOR DRAINS	SAME AS ABOVE	REROUTE FLOOR DRAINS TO 271-T SUMP: START DATE: 2/15/86 ESTIMATED COST: $13K. (SUBMITTED FOR FUNDING)

ATTACHMENT 3

CURRENT RELEASE PREVENTION BARRIERS (CONTINUED)

U/UO_3 PLANTS	SHORT TERM	LONG TERM
o HNO_3 211-U AREA	DOUBLE BARRIERS EXIST. LOCK-AND-TAG IN USE. THERE ARE LIQUID LEVEL INDICATORS AND ALARMS WITH REMOTE READOUTS AND ANNUNCIATORS.	ENGINEERING STUDY NEEDED FOR SECONDARY CONTAINMENT: CURRENTLY UNFUNDED.
o H_2SO_4 STORAGE TANK TK-D-12 (AMU)	DOUBLE BARRIERS EXIST. PROVIDE LIQUID LEVEL ALARM. CURRENTLY UNFUNDED.	SAME AS ABOVE.
o H_2SO_4 STORAGE TANK TK-331-U	DISPOSAL OF EXCESS H_2SO_4 OFFSITE	NONE NEEDED.
o PROCESS CONDENSATE TO U-12 CRIB	INSTALL INTERIM SYSTEM: DESIGN ECD: 4/11/86 INSTALL ECD: 6/30/86.	EVALUATE PERFORMANCE OF INTERIM SYSTEM.

ATTACHMENT 3

CURRENT RELEASE PREVENTION BARRIERS (CONTINUED)

OTHER FACILITIES	SHORT TERM	LONG TERM
o 2101-M LABORATORY SINKS	ADMINISTRATIVE CONTROLS. HAZARDOUS MATERIALS BEING DISPOSED OF VIA DISPOSAL REQUEST SYSTEM.	CLOSURE OF LABORATORY DRAIN SYSTEM TO BE STUDIED.
o 2703-E CHEMICAL ENGINEERING LABORATORY FLOOR DRAINS	ADMINISTRATIVE CONTROLS. PROCEDURE IN REVIEW CYCLE.	SUMP INSTALLATION TO BE CONSIDERED.
o FABRICATION SHOPS	ADMINISTRATIVE CONTROLS. PROCEDURE IN PLACE.	NONE NEEDED.
o POWERHOUSES AMU ROOMS	THERE ARE NO TANK CONNECTIONS TO THE SEWER.	CHEMICAL SEWER FLOWSHEET DOCUMENT TO BE ISSUED 2-86 WILL IDENTIFY AND PRIORITIZE POTENTIAL PROBLEM AREAS.
o CHEMICAL TANK TRUCK	ADMINISTRATIVE CONTROLS IN PLACE FOR NEUTRALIZATION AND FLUSHING OF TANK RESIDUES.	NONE NEEDED.

ATTACHMENT 3

UNFUNDED ITEMS

PUREX

- AMU TANK DRAINS. ESTIMATED COST: $600K.
- 211-A AREA DIKING. ESTIMATED COST: $150K.
- DEMINERALIZER REGENERATION SYSTEM. ESTIMATED COST: $400K (IF REQUIRED).
- PDD CONCENTRATOR DISCHARGE NEUTRALIZATION SYSTEM. ESTIMATED COST: $650K.

B PLANT

- LIQUID LEVEL ALARMS IN PROCESS/AMU SCALE TANKS. ESTIMATED COST: $250K.
- CONTAINMENT FOR PROCESS/AMU TANK OVERFLOWS. ESTIMATED COST: $250K.
- REROUTE FLOOR DRAIN PIPING TO COLLECTION TANK OR BASIN. ESTIMATED COST: $250K.
- 211-B STORAGE AREA INSTRUMENTATION UPGRADE. ESTIMATED COST: $250K.
- 211-B STORAGE AREA TANKS SECONDARY CONTAINMENT. ESTIMATED COST: $200K.

ATTACHMENT 3

process engineering

UNFUNDED ITEMS (CONTINUED)

PFP

o PRF CONSTRUCTION CHEMICAL PREPARATION TANKS SECONDARY CONTAINMENT.	COST UNDETERMINED.
o RMC CHEMICAL PREPARATION TANKS LIQUID LEVEL ALARMS.	COST UNDETERMINED.

S PLANT

o STUDY PREVENTION BARRIERS FOR HNO_3 TANK.	COST UNDETERMINED.

T PLANT

o REROUTE AMU DRAINS	ESTIMATED COST: $22K. (SUBMITTED FOR FUNDING)
o REROUTE 221-T FLOOR DRAINS	ESTIMATED COST: $104K. (SUBMITTED FOR FUNDING)

ATTACHMENT 3

Rockwell International
Rockwell Hanford Operations

UNFUNDED ITEMS (CONTINUED)

T PLANT (CONTINUED)

o REROUTE 271-T FLOOR DRAINS.	ESTIMATED COST: $13K. (SUBMITTED FOR FUNDING)
o 211-T STORAGE TANKS LIQUID LEVEL INDICATORS.	ESTIMATED COST: $65K. (SUBMITTED FOR FUNDING)
o 211-T STORAGE TANKS DIKE FOR SECONDARY CONTAINMENT.	ESTIMATE COST: $52K. (SUBMITTED FOR FUNDING)

<u>U/UO3 PLANTS</u>

o EVALUATE NEED FOR SECONDARY TANK CONTAINMENT.	COST UNDETERMINED.

ATTACHMENT 3

ENGINEERING STUDIES IN PROGRESS

TOPIC	DUE DATE
LIQUID LOW LEVEL WASTE DISPOSAL ALTERNATIVES	APR 1986
PUREX/UO_3 PLANT CHEMICAL SEWER STUDY	SEPT 1986
B PLANT/TANK FARMS CHEMICAL SEWER STUDY	SEPT 1986
PFP/T PLANT CHEMICAL SEWER STUDY	SEPT 1986
ALTERNATE DISPOSAL METHODS AT PFP	JAN 1986

ATTACHMENT 3