Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

DEC 22 2009

10-EMD-0020

Ms. Greta P. Davis
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99354

Dear Ms. Davis:

CLASS 1 MODIFICATIONS TO THE HANFORD FACILITY RESOURCE CONSERVATION AND RECOVERY ACT PERMIT, QUARTER ENDING DECEMBER 31, 2009

In accordance with Hanford Facility Resource Conservation and Recovery Act Permit (Permit) Condition I.C.3, enclosed for your notification are the Class 1 modifications for the quarter ending December 31, 2009. These modifications update information in Part III of the Permit. The modifications to Part III pertain to the 242-A Evaporator, and Waste Treatment and Immobilization Plant. The Class 1 modifications are being made to ensure that activities are conducted in compliance with the Permit. A record of these modifications is maintained in the Hanford Facility Operating Record. If you have any questions, please contact me, or your staff may contact Ray J. Corey, Assistant Manager for Safety and Environment, on (509) 376-0108.

Sincerely,

David A. Brockman
Manager

EMD:ACM

Enclosure

cc w/encl: See Page 2

cc w/encl:
W. J. Taylor, ORP
Environmental Portal, LMSI
Ecology NWP Library
HF Operating Record (S. Thompson, FHI, E6-28
Administrative Record, H6-08 (TSD: H-0-1, T-2-6, H-0-8)

cc w/o encl:
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K. A. Conaway, Ecology
K. A. Elsethagen, Ecology
T. Feigenbaum, BNI
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J. A. Hedges, Ecology
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D.G. Singleton, Ecology
E. R. Skinnarland, Ecology

ENCLOSURE

Class 1 modifications for quarter ending December 31, 2009

Ms. Greta P. Davis, Ecology
Consisting of 190 pages, including cover sheet

Hanford Facility RCRA Permit Modification Notification Forms
Part III, Operating Unit 4
242-A Evaporator

Permit Modification Index

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Page 5 of 6:	Chapter 4.0, §4.1.8
Page 6 of 6	Chapter 6.0, §6.2.2.3

Submitted by Co-Operator:

Charles G. Spencer — 12/8/09 Date

Reviewed by DOE Program Office:

Stacy L. Charbonneau — DEC 0 9 2009 Date

Hanford Facility RCRA Permit Modification Notification Form	
Unit: **242-A Evaporator**	Permit Part **Part III, Operating Unit 4**

Description of Modification:

Hanford Facility Permit, III.4:

PART III, OPERATING UNIT 4 UNIT-SPECIFIC CONDITIONS
242-A Evaporator

UNIT DESCRIPTION

The 242-A Evaporator is a mixed waste treatment and storage unit consisting of a conventional forced-circulation, vacuum evaporation system to concentrate mixed-waste solutions located in the 200 East Area.

This document sets forth the operating conditions for the 242-A Evaporator.

III.4.A COMPLIANCE WITH UNIT SPECIFIC PERMIT CONDITIONS

The Permittees shall comply with all requirements set forth in the Hanford Facility RCRA Permit (Permit) as specified in Permit Attachment 3, Permit Applicability Matrix, including all approved modifications. All chapters, subsections, figures, tables, and appendices included in the following unit-specific Permit Conditions are enforceable in their entirety.

In the event that the Part III-Unit-Specific Conditions for Operating Unit 4, 242-A Evaporator conflict with the Part I-Standard Conditions and/or Part II-General Facility Conditions of the Permit, the unit-specific conditions for Operating Unit 4, 242-A Evaporator prevail.

CHAPTERS SPECIFIC TO OPERATING UNIT GROUP 4:

Chapter 1.0	Part A Form, dated October 1, 2008
Chapter 2.0	Unit Description, dated August 2004
Chapter 3.0	Waste Analysis Plan, dated September 30, 2007
Chapter 4.0	Process Information, dated December 31, 2009~~June 30, 2007~~
Appendix 4B	Tank Integrity Assessment, dated December 31, 2002
Chapter 5.0	Groundwater Monitoring, dated (not applicable)
Chapter 6.0	Procedures to Prevent Hazards, dated December 31, 2009~~December 31, 2008~~ (also refer to Permit Attachment 33, §6.1, Security)
Chapter 7.0	Contingency Plan, dated March 31, 2009
Chapter 8.0	Personnel Training, dated September 30, 2007
Chapter 11.0	Closure and Postclosure Requirements, dated December 31, 2005
Chapter 12.0	Reporting and Recordkeeping (refer to Permit Attachment 33, Table 12.1, Reports and Records)

WAC 173-303-830 Modification Class	Class 1	Class 1	Class 2	Class 3
Please mark the Modification Class:	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number: A.1

Enter wording of WAC 173-303-830, Appendix I Modification citation:

A.1 General Permit Provisions, Administrative and informational changes

Modification Approved/Concur ☐ Yes ☐ Denied (state reason below)

Reason for denial:

Reviewed by Ecology:

G. P Davis Date

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part
242-A Evaporator	**Part III, Operating Unit 4**

Description of Modification: Chapter 4.0, §4.1.6.3.2

4.1.6.3.2 Slurry Line Piping

The slurry pump (P-B-2) transfers solution through one of two transfer lines: SL-167, for transfer to valve pit 241-AW-B (standard configuration), or SL-168 for transfer to valve pit 241-AW-A (alternate configuration~~, presently out of service~~). Slurry solution can be routed via double-encased piping from these valve pits to any designated DST slurry receiver. Both slurry transfer lines consist of 2-inch transfer piping within a 4-inch secondary containment encasement piping. Both the transfer and encasement pipes are constructed of Schedule 40 carbon steel. The lines run below grade about 73 meters between the 242-A Building and the valve pits.

These slurry lines contain leak detector risers and conductivity probes similar to the feed line piping described in Section 4.1.6.3.1.

WAC 173-303-830 Modification Class	Class 1	Class 1	Class 2	Class 3
Please mark the Modification Class:	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number: A.1

Enter wording of WAC 173-303-830, Appendix I Modification citation:

A.1 General Permit Provisions, Administrative and informational changes

Modification Approved/Concur ☐ Yes ☐ Denied (state reason below)

Reason for denial:

Reviewed by Ecology:

G. P Davis

Date

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part
242-A Evaporator	**Part III, Operating Unit 4**

Description of Modification: Chapter 4.0, §4.1.6.3.3:

4.1.6.3.3 PC-5000

The process condensate transfer line (PC-5000) from the 242-A Evaporator is centrifugally cast, fiberglass-reinforced epoxy thermoset resin pressure pipe fabricated to meet the requirements of ASME D2997 (ASME 1984). The 3-inch (7.6-cm) carrier piping is centered and supported within 6-inch (15.2-cm) containment piping. Pipe supports are fabricated of the same material as the pipe, and meet the strength requirements of ANSI B31.3 (ANSI 1987) for dead weight, thermal, and seismic loads.

Drawing H-2-79604 provides details of the piping from the 242-A Evaporator to LERF.

This permit includes the portion of the PC-5000 line leaving the 242-A Evaporator facility to the fence line of LERF (Chapter 1.0 and topographic maps for unit boundary).

Single-point electronic leak detection elements are installed along the transfer line at 305-meter (1000 foot) intervals. The leak detection elements are located in the bottom of specially designed test risers. Each sensor element employs a conductivity sensor, which ~~is connected to a cable leading back~~provides a signal to the 242-A Evaporator control room when a potential leak is detected. If a leak develops in the carrier pipe, fluid will travel down the exterior surface of the carrier pipe or the interior of the containment pipe. As moisture contacts a sensor unit, a general alarm sounds in the 242-A Evaporator control room on the Monitoring Control System. In addition, the zone of the sensor unit causing the general alarm can be determined using the ~~automated~~ leak detection-monitoring panel. Upon verification of a leak, ~~T~~the pump located in the 242-A Evaporator is shut down, stopping the flow of aqueous waste through the transfer line. A low-volume air purge of the annulus between the carrier pipe and the containment pipe is provided to prevent condensation buildup and minimize false alarms by the leak detection elements.

If a leak is detected using visual inspection of the PC-5000 transfer line encasement at ~~LERF Valve HV-43-2~~the encasement catch tank (TK-PC-101) in the LERF catch basin (242AL-43), the shift manager is notified. The Shift Manger will direct shutdown of the aqueous waste through the PC-5000 transfer line.

WAC 173-303-830 Modification Class	Class 1	Class 1	Class 2	Class 3
Please mark the Modification Class:	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number: A.3

Enter wording of WAC 173-303-830, Appendix I Modification citation:

A.3 General Permit Provisions, Equipment replacement or upgrading with functionally equivalent components (e.g., pipes, valves, pumps, conveyors, controls)

Modification Approved/Concur ☐ Yes ☐ Denied (state reason below)

Reason for denial:

Reviewed by Ecology:

G. P Davis Date

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part
242-A Evaporator	**Part III, Operating Unit 4**

Description of Modification: Chapter 4.0, §4.1.8:

4.1.8 Tank Management Practices

All waste to be processed at the 242-A Evaporator must be sampled to determine if the waste is compatible with the materials of construction at the 242-A Evaporator. Before each campaign, candidate feed tanks are sampled per the requirements of the waste analysis plan (Chapter 3.0). Based on the results, three possible options are implemented.

- The waste is acceptable for processing without further actions.
- The waste is unacceptable for processing as a single batch, but is acceptable if blended with other waste that is going to be processed.
- The waste is unacceptable for processing.

The 242-A Evaporator process is controlled by the MCS. The MCS computer monitors liquid levels in the vapor-liquid separator (C-A-1) and condensate collection tank (C-100). The MCS system manages liquid levels in the C-A-1 using an auto-cascade function that controls feed delivery to the C-A-1 vessel. The MCS system also manages liquid levels in the C-100 using an auto-cascade function to maintain the tank level at approximately 50-percent. The MCS has alarms that annunciate on high-liquid levels for both C-A-1 and C-100 to notify operators that actions must be taken to prevent overfilling of these vessels.

An interlock is activated when high-liquid level in the vapor-liquid separator (C-A-1) is detected, automatically shutting down the feed transfer pump at feed tank 241-AW-102, thereby preventing overfilling of the vessel and carryover of slurry into the process condensate system. The condensate collection tank (C-100) has an overflow line that routes solution to feed tank 241-AW-102 in case of overfilling.

Process and instrumentation drawings are listed in Section 4.3.

The MCS also provides an automated interlock to shutdown the ~~process condensate pump (P-C-100),~~ recirculation pump (P-B-1)~~,~~ and slurry pump (P-B-2) if a leak is detected. The ~~process condensate pump (P-C-100),~~ recirculation pump (P-B-1) and slurry pump (P-B-2)~~, can~~ will be shutdown automatically using the MCS interlock and/or manually at the direction of the Shift Manager or 242-A Evaporator Control Room Operator if a leak occurs. The process condensate pump (P-C-100) ~~can~~will be shut down manually at the direction of the Shift Manager or 242-A Evaporator Control Room Operator if a leak occurs.

WAC 173-303-830 Modification Class	Class 1	Class 1	Class 2	Class 3
Please mark the Modification Class:	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number: A.3

Enter wording of WAC 173-303-830, Appendix I Modification citation:

A.3 General Permit Provisions, Equipment replacement or upgrading with functionally equivalent components (e.g., pipes, valves, pumps, conveyors, controls)

Modification Approved/Concur ☐ Yes ☐ Denied (state reason below)

Reason for denial:

Reviewed by Ecology:

G. P Davis

Date

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part
242-A Evaporator	**Part III, Operating Unit 4**

Description of Modification: Chapter 6.0, §6.2.2.3:

6.2.2.3 Leak Detectors

The sample enclosures in the load out and hot equipment storage room have leak detectors for both the feed and slurry samplers. For information on these systems and their secondary containment, refer to Chapter 4.0, §4.1.4.

Leaks to secondary containment in the evaporator room, pump room, hot equipment storage room, and load out room drain to the pump room sump. The sump high-level alarm serves as a leak detector for these rooms. For information on the rooms and their drain systems, refer to Chapter 4.0, §4.1.4.

There are conductivity probe leak detectors installed in the secondary containment of the feed transfer line, slurry line, and drain lines connecting the 242-A Evaporator to AW Tank Farm. However, these detectors are considered part of the DST System.

The PC-5000 transfer line may be continuously monitored during transfers by an ~~automated~~ electronic leak detection system (Chapter 4.0) or visually inspected at the ~~LERF Valve HV-43-2~~encasement catch tank (TK-PC-101) in the LERF catch basin (242AL-43). The ~~automated~~ leak detection system alarms are monitored in the 242-A Evaporator Control Room on the Monitoring and Control System (§4.1.6.3.3). When necessary, ~~Visual~~ visual inspections of the PC-5000 transfer line encasement are administratively controlled by the Shift Manager and occur at a minimum once every 24 hours during waste water transfers through the PC-5000 transfer line to ensure compliance with WAC 173-303-640(4)(c)(iii). Visual inspection for leaks from the PC-5000 transfer line are performed by 242-A Evaporator Operations, by looking for signs of any liquid not ~~contributed~~ attributed to rain/precipitation at the ~~open LERF HV-43-2 valve~~encasement catch tank (TK-PC-101). If any liquid is observed the Shift Manager is notified to take corrective actions.

WAC 173-303-830 Modification Class	Class 1	Class 1	Class 2	Class 3
Please mark the Modification Class:	X			

Enter relevant WAC 173-303-830, Appendix I Modification citation number: A.3

Enter wording of WAC 173-303-830, Appendix I Modification citation:

A.3 General Permit Provisions, Equipment replacement or upgrading with functionally equivalent components (e.g., pipes, valves, pumps, conveyors, controls)

Modification Approved/Concur ☐ Yes ☐ Denied (state reason below)

Reason for denial:

Reviewed by Ecology:

G. P Davis Date

Hanford Facility RCRA Permit Modification
Part III, Operating Unit 4
242-A Evaporator

Remove and replace the following sections for Part III, Operating Unit 4:

- Part III, OU-4, Permit Conditions dated March 31, 2009 with Permit Conditions dated December 31, 2009
- Part III, OU-4, Chapter 4, dated June 30, 2007 with Chapter 4, dated December 31, 2009
- Part III, OU-4, Chapter 6, dated March 31, 2007 with Chapter 6, dated December 31, 2009

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PART III, OPERATING UNIT 4 UNIT-SPECIFIC CONDITIONS

242-A Evaporator

UNIT DESCRIPTION

The 242-A Evaporator is a mixed waste treatment and storage unit consisting of a conventional forced-circulation, vacuum evaporation system to concentrate mixed-waste solutions located in the 200 East Area.

This document sets forth the operating conditions for the 242-A Evaporator.

III.4.A COMPLIANCE WITH UNIT SPECIFIC PERMIT CONDITIONS

The Permittees shall comply with all requirements set forth in the Hanford Facility RCRA Permit (Permit) as specified in Permit Attachment 3, Permit Applicability Matrix, including all approved modifications. All chapters, subsections, figures, tables, and appendices included in the following unit-specific Permit Conditions are enforceable in their entirety.

In the event that the Part III-Unit-Specific Conditions for Operating Unit 4, 242-A Evaporator conflict with the Part I-Standard Conditions and/or Part II-General Facility Conditions of the Permit, the unit-specific conditions for Operating Unit 4, 242-A Evaporator prevail.

CHAPTERS SPECIFIC TO OPERATING UNIT GROUP 4:

Chapter 1.0	Part A Form, dated October 1, 2008
Chapter 2.0	Unit Description, dated August 2004
Chapter 3.0	Waste Analysis Plan, dated September 30, 2007
Chapter 4.0	Process Information, dated December 31, 2009
Appendix 4B	Tank Integrity Assessment, dated December 31, 2002
Chapter 5.0	Groundwater Monitoring, dated (not applicable)
Chapter 6.0	Procedures to Prevent Hazards, dated December 31, 2009 (also refer to Permit Attachment 33, §6.1, Security)
Chapter 7.0	Contingency Plan, dated March 31, 2009
Chapter 8.0	Personnel Training, dated September 30, 2007
Chapter 11.0	Closure and Postclosure Requirements, dated December 31, 2005
Chapter 12.0	Reporting and Recordkeeping (refer to Permit Attachment 33, Table 12.1, Reports and Records)

III.4.B COMPLIANCE WITH UNIT-SPECIFIC PERMIT CONDITIONS

III.4.B.1 Portions of Permit Attachment 4 (DOE/RL-94-02) that are not made enforceable by inclusion in the applicability matrix for that document are not made enforceable by reference in this document.

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Chapter 4.0 Process Information

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4.0 PROCESS INFORMATION

Where information regarding treatment, management, and disposal of the radioactive source byproduct material and/or special nuclear components of mixed waste (as defined by the Atomic Energy Act of 1954 as amended) has been incorporated into this document, it is not incorporated for the purpose of regulating the radiation hazards of such components under the authority of this permit or chapter 70.105 RCW and its implementing regulations but is provided for information purposes only.

The 242-A Evaporator receives mixed waste from the DST System that contains inorganic and organic constituents and radionuclides. A 242-A Evaporator simplified process flow diagram is given in Figure 4.1. The 242-A Evaporator separates the mixed waste received from the DST System, generating the following waste streams:

A concentrated aqueous waste stream (slurry) containing the nonvolatile components, including most of the radionuclides, inorganic constituents, and nonvolatile organics such as tri-butyl phosphate

A dilute aqueous waste stream (process condensate) containing the volatile components, primarily water with low concentrations of radionuclides, inorganic constituents, and volatile constituents such as ammonia and acetone.

The slurry is routed back to the DST System pending further treatment. The process condensate is transferred to the LERF for storage until processed through the ETF.

The 242-A Evaporator process employs a conventional forced circulation, vacuum evaporation system to concentrate the DST System waste solution. The major components of this system include the reboiler, vapor-liquid separator, recirculation pump and pipe loop, slurry product pump, condenser, jet vacuum system, and condensate collection tank

The vapor-liquid separator, C-A-1, also called the evaporator vessel, and the condensate collection tank, C-100, meet the definition of a tank in WAC 173-303-040. Other process equipment associated with these tank systems is considered ancillary equipment. Drawings that aid in understanding the systems are provided in Section 4.3.

The 242-A Evaporator receives waste from a DST System tank, 241-AW-102 that serves as the 242-A Evaporator feed tank. The feed enters the recirculation line and blends with the main process slurry stream, which is pumped to the reboiler.

In the reboiler, the mixture is heated to the specified operating temperature, normally 38 to 77EC, using 21 to 69 kilopascals gauge pressure steam. The low-pressure steam provides adequate heat input, and the resulting low-temperature differential across the reboiler minimizes scale formation on the heat transfer surfaces. The static pressure of the waste in the reboiler is sufficient to suppress the boiling point so the waste does not boil in the reboiler tubes. Boiling occurs only near or at the liquid surface in the vapor liquid separator.

The heated slurry stream is discharged from the reboiler to the vapor-liquid separator (C-A-1) that typically is maintained at an absolute pressure of 5.3 to 10.7 kilopascals. Under this reduced pressure, a fraction of the water in the heated slurry flashes to steam and the steam is drawn through two, wire mesh deentrainer pads into a 42-inch diameter vapor line that leads to the primary condenser, leaving behind a more concentrated slurry solution in the vapor-liquid separator.

After a brief residence time in the vapor-liquid separator, the slurry exits from the bottom through the lower portion of the recirculation line and is recirculated by the recirculation pump (P-B-1). The pump discharges the slurry back to the reboiler via the upper portion of the recirculation line, thus completing the recirculation loop.

The specific gravity of the waste liquid is monitored closely to ensure that the target density, established before the beginning of the campaign, is not exceeded. A portion of the slurry is removed from the upper portion of the recirculation line using the slurry pump (P-B-2) and transferred through an encased underground pipeline (pipe-within-a-pipe) to a designated slurry receiver tank in the DST System.

The vapors are drawn from the vapor-liquid separator, through a 42-inch diameter vapor line and enter a series of three condensers, where the vapors are condensed using raw water. The condensed vapors, called process condensate, are collected in tank C-100. Steam jets are used to create a vacuum on the vapor liquid separator drawing the process vapors into and through the condensers. Noncondensable vapors are drawn from the condensers, then through a series of particulate filters and vented to the atmosphere. The air discharges are monitored continuously when the 242-A Evaporator is operating to verify that standards for radionuclide and ammonia emissions standards are met.

Process condensate contains the volatile constituents of the waste and trace quantities of inorganic materials and radionuclides. The process condensate is pumped from tank C-100 through an encased underground pipeline (pipe-within-a-pipe) to the LERF.

During a campaign, the evaporation process is continuous with typical feed flow rates of 260 to 450 liters per minute, process condensate flow rates of 150 to 230 liters per minute, and slurry flow rates of 110 to 230 liters per minute. The evaporator process is shutdown when the desired endpoint concentration of the slurry is met. Endpoints are established at the beginning of the campaign, based on the target specific gravity of the waste, or allowable waste volume reduction (WVR) and defined operating limits. If the evaporation rate cannot achieve the desired endpoint, slurry in the DST System serving as the slurry receiver is transferred to the feed tank for one or more passes through the 242-A Evaporator. At the end of each campaign, the 242-A Evaporator process equipment is shutdown, emptied, flushed with raw water, and placed in a safe standby mode.

Other discharges during 242-A Evaporator processing include condensate from the steam used to heat the waste and cooling water used to condense the vapors. The 242-A Evaporator is designed to prevent contamination of these streams. The fluids on the uncontaminated side of the heat exchangers are maintained at a higher pressure than the waste stream so that uncontaminated fluid migrates toward the contaminated waste if a leak were to occur. The steam condensate and the cooling water are monitored continuously for radiation, pH, conductivity, and discharged to TEDF as long as none of the discharge limits are exceeded. The steam condensate and cooling water streams were assessed in the stream specific reports (WHC 1990a and WHC 1990b) and are not dangerous waste in accordance with WAC 173-303.

The 242-A Evaporator process is controlled by the MCS. The MCS computer monitors process parameters and controls the parameters where required. Once the configuration parameters and other process control inputs are set, the MCS maintains the process parameters within specified ranges by sending output signals that operate specific pieces of equipment (e.g., control valves).

4.1 TANK SYSTEMS

This section discusses information associated with design requirements, integrity assessments, and any additional requirements for tanks used to treat and store mixed waste in the 242-A Evaporator.

4.1.1 Design Requirements

The following design requirements were addressed in the 242-A Evaporator/Crystallizer Tank System Integrity Assessment Report (IAR) (Appendix 4B):

Minimum design wall thicknesses and measured wall thicknesses at various points throughout the tank systems
Design standards used in construction, including references
Waste characteristics
Materials of construction and compatibility of materials with the waste being processed
Corrosion protection
Seismic design basis evaluation

The conclusion of the integrity assessment report is that the 242-A Evaporator system is not leaking and is fit for use. The inspections, tests, and analyses performed provide assurance that the tank system has

adequate design, sufficient structural strength, and sufficient compatibility with the waste to not collapse, rupture, or fail during operation. The report also states that a review of construction files indicates that the building structure was designed and constructed to withstand a design-basis earthquake.

4.1.2 PC-5000 Transfer line

Process condensate from the 242-A Evaporator is transferred to the LERF using a pump located in the 242-A Evaporator and approximately 1,500 meters of pipe, consisting of a 3-inch carrier pipe within a 6-inch outer containment pipeline. Flow through the pump is controlled through a valve at flow rates from 150 to 300 liters per minute.

The encased fiberglass transfer line (PC-5000) exits the 242-A Evaporator below grade and remains below grade at a minimum 1.2-meter depth for freeze protection, until the pipeline emerges at the LERF catch basin, at the corner of each basin. All piping at the catch basin that is less than 1.2 meters below grade is wrapped with electric heat tracing tape and insulated for protection from freezing. Additional detail including information on secondary containment, leak detection and integrity assessment for this line is provided in § 4.1.6.3.3 and §4.1.4.1.

4.1.3 Vapor-Liquid Separator (C-A-1) and Ancillary Equipment

The following sections describe the vapor-liquid separator (C-A-1) and ancillary equipment.

Waste Feed System. Feed to the 242-A Evaporator is supplied via a pump located in the 241-AW-102 feed tank. The feed pump transfers the waste to the 242-A Evaporator through a 3-inch diameter carbon steel transfer pipeline encased in a 6-inch diameter carbon steel pipe to provide secondary containment. The feed pipeline is equipped with a leak detection system.

Samples can be taken from the waste feed when needed. The feed sampler (SAMP-F-1) is located in a sample enclosure located in the hot equipment storage room.

Evaporator Process Loop. The 242-A Evaporator process loop equipment components are as follows:

- Reboiler (E-A-1)
- Vapor-liquid separator (C-A-1)
- Recirculation pump (P-B-1)
- Recirculation loop

Figure 4.2 is a simplified process flow diagram showing the major components of the process loop.

Reboiler (E-A-1). Waste is heated as the waste passes through the reboiler before entering the vapor-liquid separator. The reboiler is a vertical tube unit with steam on the shell-side and process solution on the tube-side. The 364 tubes in the reboiler are enclosed in a 1.03-meter outside diameter, 4.6-meter-long stainless steel shell. Both the reboiler shell and tubes are constructed of 304L stainless steel. The shell is 0.64 centimeter thick and the tubes are 14-gauge steel. The reboiler is designed to distribute steam evenly and to prevent tube damage from water droplets that may be present in the steam.

Vapor-Liquid Separator (C-A-1). Process solution from the reboiler enters the vapor-liquid separator via the upper recirculation line. Some of the solution flashes into vapor, which exits through a vapor line at the top of the vapor-liquid separator. The remaining solution (slurry) exits through the recirculation line at the bottom.

The separator consists of a lower and upper section. The lower (liquid) section is a stainless steel shell 4.3 meters in diameter having an 85,200 to 94,600 liter normal operating capacity (including recirculation loop and reboiler). The maximum design capacity is 103,000 liters. The upper (vapor) section is a stainless steel shell 3.5 meters in diameter containing two deentrainment pads. These wire mesh pads remove liquids and solids that entrain into the vapor section of the vessel. Spray nozzles, using recycled process condensate or filtered raw water, wash collected solids from the deentrainment pads and vessel walls. Both sections of the vapor-liquid separator are constructed of 0.95-centimeter-thick stainless steel.

Operating parameters in the vapor-liquid separator are monitored to provide an indication of process problems such as slurry foaming, deentrainer flooding, or excessive vapor temperatures. Instrumentation also is available to monitor the liquid levels in the vapor-liquid separator. Interlocks are activated when high pressures or high- or low-liquid levels are detected, shutting down the evaporation process and placing the facility in a safe configuration.

The vapor-liquid separator and recirculation loop can be flushed to remove any residual solids from the system and/or to reduce radiation levels. The most common flush solution is water, but dilute nitric or citric acid solutions could be used. All acidic flush solutions are chemically adjusted to meet DST acceptance criteria before transfer to the DST System. Antifoam solution is added (at very low flow rates - approximately 0.04 to 0.4 liters per minute) to the vessel to prevent foaming. The antifoam solution is a noncorrosive, nonregulated silicone-based solution that is compatible with the evaporator components.

Recirculation Pump. The stainless steel recirculation pump (P-B-1), is constructed as part of the recirculation loop to the reboiler. The 28-inch diameter axial flow pump has 60,900 liters per minute output. The recirculation pump is designed to handle slurry up to 30 percent undissolved solids by volume at specific gravities up to 1.8. The recirculation pump moves waste at high velocities through the reboiler to improve heat transfer, keep solids in suspension, and reduce fouling of the heat transfer surfaces.

The recirculation pump is equipped with shaft seals with high-pressure recycled process condensate (or water) introduced between the seals to prevent the waste solution from leaking out of the system. Seal water pressure and flow are monitored and controlled to shut down the recirculation pump if conditions are not adequate to prevent waste liquid from migrating into the seal water. The used seal water is routed to the feed tank.

Recirculation Loop. The recirculation loop consists of a 28-inch diameter stainless steel pipe that connects the vapor-liquid separator to the recirculation pump and reboiler. The lower loop runs from the bottom of the vapor-liquid separator to the recirculation pump inlet. The upper loop connects the pump discharge to the reboiler and the reboiler to the vapor-liquid separator. The feed line from the feed tank and the slurry line to underground storage tanks are connected to the upper recirculation line.

Slurry System. The slurry system draws a portion of the concentrated waste from the upper recirculation loop and transfers it to the DST System. The major components of the slurry system are the slurry pump and the slurry transfer pipelines. Figure 4.3 shows a simplified flow diagram of the slurry system. These components are described in the following paragraphs.

The slurry pump (P-B-2) is used to transfer slurry from the recirculation loop to the underground storage tanks. The pump is driven by a variable speed motor and is constructed of 304L stainless steel. The slurry pump is designed to generate high pressures to alleviate the possibility of a transfer line plugging.

Interlocks control the operation of the slurry pump. The slurry pump (P-B-2) is shutdown if any of the following occur:

Excessive pressure is detected in the slurry lines to 241-AW Tank Farm
A leak is detected in the slurry transfer lines secondary containment
A leak is detected in the 241-AW Tank Farm process pits where the transfer lines enter the DST System.

The slurry pump uses a shaft seal with recycled process condensate (or water) and pressure and flow controls similar to the system described above for the recirculation pump.

Transfer pipelines are 2-inch diameter, carbon steel encased lines which route slurry to a designated underground DST within the 200 East Area. All transfer pipelines are encased in a secondary containment pipe and equipped with leak detectors between the primary and encasement piping. The pipelines are sloped to drain to the valve pit. The detection of any leak by the automated leak detection system shuts off the slurry pump. In lieu of the MCS automated shutdown, the slurry pump (P-B-2) can be manually shutdown at the direction of the Shift manager or 242-A Evaporator Control Room operator if a leak occurs.

The flow rate of the slurry transfer to the DST System is monitored and a decrease in flow below a specified value automatically will shut down the slurry pump (P-B-2) and initiate a line flush with water. The objective of flushing the transfer line is to prevent settling of solids, which precludes plugging the slurry transfer lines.

Samples can be taken from the slurry line when needed via a sampler (SAMP-F-2) that is located near the feed sampler in the load out and hot equipment storage room.

4.1.3.1 Condensate Collection Tank (C-100) and Ancillary Equipment

The following section discusses the condensate collection tank (C-100) and ancillary equipment. This equipment collects process condensate via the condensers in the vacuum condenser system, filters the condensate, and pumps the process condensate to LERF. Figure 4.4 provides a simplified process flow diagram showing the major components of the process condensate system. The following major components make up the process condensate system:

Vacuum condenser system
Condensate collection tank (C-100)
Process condensate pump (P-C-100)
Condensate filters (F-C-1, F-C-2, and F-C-3)
Process condensate radiation monitoring, sampling system and diversion system (RC3)
Seal pot
Process condensate recycle system
Vessel Vent System

Vacuum Condenser System. Vapors removed from the vapor-liquid separator flow to a series of three condensers where the vapors are condensed using raw water. Condensate drains to the condensate collection tank (C-100). The vacuum condenser system consists of the following major components:

Primary condenser (E-C-1)
Intercondenser (E-C-2)
Aftercondenser (E-C-3)
Steam jet ejectors (J-EC1-1 and J-EC2-2)

Figure 4.5 provides a simplified process flow diagram showing the major components of the vacuum condenser system. These system components are discussed in the following sections.

Primary Condenser (E-C-1). Vapors drawn from the vapor-liquid separator flow through the 42-inch (3.5 feet) vapor line, into the E-C-1 condenser where the majority of the condensation takes place. Noncondensed vapors exit to the intercondenser (E-C-2) while the condensed vapors (process condensate) drain to the condensate collection tank (C-100). Cooling water passes through the cooling tubes and exits to TEDF.

The carbon steel condenser shell measures approximately 5.3 meters (17.4 feet) long and has a 2.2-meter (7.2 feet) inside diameter. The condenser consists of 2,950 equally spaced carbon steel tubes that are 3.6 meters (11.8 feet) long with a 1.9-centimeter (0.75 inches) outside diameter.

Intercondenser (E-C-2). Noncondensed vapors from E-C-1 enter the intercondenser. The vapor stream contacts the cooling tubes in the condenser where cooling water provides additional condensation. The condensate drains to the condensate collection tank (C-100). Noncondensed vapors and used cooling water are routed to the after condenser.

The carbon steel intercondenser measures 2.2 meters (7.2 feet) long with a 0.39 meter (1.3 feet) inside diameter. This heat exchanger contains 144 tubes that are 1.7 meters (5.6 feet) long with a 1.9-centimeter (0.75 inches) outside diameter.

After condenser (E-C-3). Vapor discharged from the intercondenser enters the after condenser. Cooling is supplied to the after condenser by the cooling water from the intercondenser. Condensate is routed to the condensate collection tank (C-100), while the noncondensed vapors are filtered, monitored, and

discharged to the atmosphere through the vessel ventilation system. The cooling water is discharged to TEDF.

The carbon steel after condenser measures 2.3 meters (7.5 feet) long and has a 0.20-meter (0.66 feet) inside diameter. This heat exchanger contains 45 tubes that are 1.8 meters (5.9 feet) long with a 1.9-centimeter (0.75 inches) outside diameter.

Steam Jet Ejectors. The vacuum that draws the vapors from C-A-1 into the condensers is created by a two-stage steam jet ejector system. The first-stage jet ejector (J-EC1-1) maintains a vacuum on the primary condenser, which in turn creates a vacuum on the vapor-liquid separator. The ejector consists of a steam jet, pressure controller, and air bleed-in valve. Steam and noncondensed vapors from the primary condenser are ejected from J-EC1-1 into the intercondenser. The desired vacuum is obtained by controlling steam pressure and bleeding ambient air as necessary into the vapor header through an air intake filter. The second-stage jet ejector (J-EC2-1) creates the vacuum that moves vapors from the intercondenser through the after condenser.

Condensate Collection Tank (C-100). Process condensate from the primary condenser, intercondenser, after condenser, and the vessel ventilation system drain to the condensate collection tank (C-100). The tank is 4.3 meters in diameter, 5.8 meters high, and is constructed of 0.79-centimeter (0.31 inches)-thick stainless steel. The tank has a maximum design capacity of 67,400 liters (17,805 gallons). Normal operating volume is approximately 50 percent of the tank capacity. A carbon steel base supports the tank. An agitator is installed but not used.

In the event of a tank overflow, the solution is routed through an overflow line to the drain system, which returns waste to the feed tank (241-AW-102). Overflow occurs when the volume exceeds about 60,600 liters. The overflow line is equipped with a liquid filled trap to isolate the drain system from the tank.

Process feed samples are evaluated for the presence of a separate organic layer and process controls are used to reduce the risk of the condensate collection tank to receive small amounts of immiscible organics with the condensed waste. If detected, the organic layer is removed by overflowing tank C-100 back to the feed tank 241-AW-102. The liquid level in the tank is controlled well above the discharge pump intake point and a controlled overflow is conducted upon completion of each processing cycle (campaign) to ensure that an organic layer does not accumulate and cannot be pumped to LERF.

Process Condensate Pump. A pump (P-C-100) moves the process condensate from tank C-100 through the condensate filter to LERF. The process condensate pump is a centrifugal pump constructed of 316 stainless steel.

Condensate Filters. After leaving the condensate collection tank, the process condensate is filtered to remove solids. The primary condensate filter (F-C-1) has a welded steel housing. A second filter system (F-C-3), installed downstream is also used to filter the process condensate. This system has duplex in-line filters in cast iron housing. Both filters employ a filter material that is compatible with the process condensate.

Process Condensate Radiation Monitoring, Sampling and Diversion System. The process condensate transferred to LERF is monitored continuously for radiation. If radiation levels exceed established limits, an alarm is received and interlocks immediately divert the stream back to the condensate collection tank (or the feed tank) and shut off the process condensate pump. This ensures process condensate containing excessive radionuclides due to an accidental carryover from the vapor-liquid separator is not transferred to LERF.

Seal Pot. The condensate collection tank receives condensed liquids from the vessel ventilation system. A seal pot collects the drainage before discharge into the condensate collection tank and isolates the tank from the vessel ventilation system.

Condensate Recycle System. For waste minimization, a portion of the process condensate from tank C-100 is recycled for use as decontamination solution for the deentrainment pad sprays and seal water for

the recirculation pump (P-B-1) and slurry pump (P-B-2). Use of process condensate instead of raw water results in approximately 10 percent reduction in waste volume generated during continuous operation of the 242-A Evaporator. Filtered raw water also is available as a backup for sprays and seal water. A 2-inch (5.1 centimeters) diameter carbon steel line, stainless steel centrifugal pump (P-C106), and filters (F-C-5 and F-C-6) supply process condensate from tank C-100 to the pad sprays and pump seals. The filters are disposable cartridge filters in carbon steel housings arranged in parallel with one filter in service while the other is in standby.

4.1.4 Integrity Assessments

The integrity assessment report (Appendix 4B, Integrity Assessment Report) discusses:

- The standards used during design and construction of the 242-A Evaporator and the adequacy of those standards
- The characteristics of the DST waste processed
- The adequacy of the materials of construction to provide corrosion protection from the waste processed
- The age of the tanks and the affect of age on tank integrity
- The results of the leak tests, visual inspections, and tank wall thickness inspections
- The frequency and scope of future integrity assessment
- Deficiencies in secondary containment design. These deficiencies are discussed in-the integrity assessment report.

An independent, qualified, registered professional engineer certified the integrity assessment.

The inspections, tests, and analyses performed provide assurance that the 242-A Evaporator tank system has adequate design, sufficient structural strength, and sufficient compatibility with the waste to not collapse, rupture, or fail during operation. No evidence of degradation was noted during the visual test, ultrasonic test, or leak test. Both condensate collection tank C-100 and the vapor-liquid separator/reboiler loop passed leak tests. The frequency of subsequent integrity assessments has been established at every 10 years. This frequency is based on the results of the 1998 integrity assessment.

4.1.4.1 PC-5000

An integrity assessment for PC-5000 was performed, including a hydrostatic leak/pressure test at 10.5 kilograms per square centimeter gauge (150 pounds per square inch). A statement by an independent, qualified, registered professional engineer attesting to the integrity of the piping system is included in *Integrity Assessment Report for the 242-A Evaporator/LERF Waste Transfer Piping, Project W105* (WHC 1993), along with the results of the leak/pressure test. The next integrity assessment for PC-5000 will be conducted in the calendar year 2008. The schedule for conducting integrity assessments will be at a frequency of every 10 (calendar) years unless otherwise required by an IQRPE or as required for system repairs and upgrades. All integrity assessments will be conducted in accordance with WAC 173-303-640.

4.1.5 Additional Requirements for Existing Tanks

Refer to information in Section 4.1.2 and the integrity assessment report, which includes measuring tank wall thicknesses, evaluating corrosion protection, and performing leak tests.

4.1.6 Secondary Containment and Release Detection for Tank Systems

This section describes the design and operation of secondary containment sumps, drain lines, and leak detection systems for the 242-A Evaporator.

4.1.6.1 Requirements for All Tank Systems

The Construction Specification for 242-A Evaporator-Crystallizer Facilities Project B-100 (Vitro 1974) was used during preparation, design, and construction of the tank and secondary containment systems. The integrity assessment report details how the construction specification relates to the national codes and standards.

Constructing the building and vessels per this specification ensures that foundations are capable of supporting tank and secondary containment systems and that uneven settling and failures from pressure gradients do not occur. The integrity assessment report (Appendix 4B) states that the 242-A Evaporator has adequate design, sufficient structural strength, and sufficient compatibility with the wastes to not collapse, rupture, or fail during service loads associated with normal operations and that the building structure was designed and constructed to withstand a design basis earthquake".

The integrity assessment report (Appendix 4B) describes the building and secondary containment system. This system is designed to ensure any release is detected within 24 hours. The secondary containment system also is designed to contain 100 percent of the maximum operating capacity of the vapor-liquid separator/reboiler loop, and the drain systems are sloped to allow collection of solution and have sufficient capacity to drain this volume in less than the required 24 hours.

The integrity assessment report describes the protective coating material and sealant used to protect concrete and joints from attack by leaks to the secondary containment. The materials of construction for the sump and drain lines are also compatible with the waste processed at the 242-A Evaporator.

4.1.6.2 242-A Building Secondary Containment

The 242-A Building serves as a secondary containment vault for the vapor-liquid separator (C-A-1), condensate collection tank (C-100), and ancillary equipment used for transferring mixed waste at the 242-A Evaporator. The concrete for the operating area was poured to form a monolithic structure. Where needed, joints in the concrete were fabricated with preformed filler conforming to the standards of the American Society of Testing and Materials. Joint filler is sealed with a polysulfide sealant per the requirements of the construction specifications (Vitro 1974).

Before restart in 1994, a new acrylic special protective coating was applied to the concrete in the pump, evaporator, and condenser rooms. The coating meets the requirements of the construction specifications (Vitro 1974), including resistance to very high radiations doses, temperatures of 77o C, and spills of 25 percent caustic solution.

The following six rooms contain equipment used to process or store*mixed waste:

Pump room
Evaporator room
Condenser room
Ion exchange room
Load out room* (used for temporary storage of mixed waste)
Hot equipment storage room.

4.1.6.2.1 Pump Room

The pump room secondary containment walls are 0.38 to 0.56-meter (1.25 to 1.84-feet) thick reinforced concrete. The secondary containment floor is 0.51-meter-thick reinforced concrete. The pump room floor is lined with 0.64-centimeter (0.25-inch) stainless steel and the concrete walls and ceiling cover blocks are painted with a special protective coating. The pump room contains pipe jumpers used to transport feed and slurry solutions between the vapor-liquid separator and the DST System, and the process recirculation loop, recirculation pump (P-B-1), and slurry pump (P-B-2).

Leaks in the pump room collect in the pump room sump, a 1.5-meter (4.9-feet) by 1.5-meter (4.9-feet) by 1.8-meter (5.9 feet) deep sump with a 0.64-centimeter (0.25-inch) stainless steel liner. The pump room sump collects spills from various sources for transfer to the feed tank, 241-AW-102. Figure 4.6 provides a simplified process flow schematic of sources, which drain to the pump room sump. Drainage to the sump includes:

Leaks to the pump room floor from equipment in the pump room
Evaporator room floor drain
Hot equipment storage room floor drain
Load out room floor drain
Raw water backflow preventer drain

Solution in the pump room sump is transferred to the feed tank (241-AW-102) using a steam jet. A 10-inch secondary containment overflow line is provided for draining large volumes of solution should a catastrophic tank failure occur. Because the overflow line provides a direct path between the air space of tank 241-AW-102 and the pump room, a minimum level of water must be maintained in the sump to prevent cross ventilation. A leak into the pump room sump would be detected by a rise in the sump level. Instrumentation provided alarms on high sump level.

The recirculation and slurry pumps in the pump room are equipped with mechanical seals having pressurized water introduced between the seals. The seal water is maintained at a pressure that exceeds the process pressure at the seal to ensure water leaks into the process solution, but waste solution does not leak out. Water from seal leakage is collected in funnels in the pump room and routed to feed tank 241-AW-102 via the 10-inch overflow line described previously.

4.1.6.2.2 Evaporator Room

The evaporator room secondary containment walls are 0.56-meter-thick reinforced concrete. The secondary containment floor is 0.51-meter-thick reinforced concrete. The evaporator room contains the vapor-liquid separator vessel (C-A-1), part of the recirculation loop, the reboiler, the 42-inch vapor line, and line used to empty the vapor-liquid separator to feed tank 241-AW-102.

Leaks in the evaporator room flow to a floor drain that routes through a 3-inch line to the pump room sump described in Section 4.1.6.2.1. A leak in the evaporator room would be detected by a rise in the pump room sump level. The floor of the evaporator room and a portion of the pump room floor are 3.0 meters below grade to contain the entire contents of the vapor-liquid separator, reboiler, and recirculation loop in the event of a catastrophic failure. The floor and walls of the evaporator room up to an elevation of 1.8 meters are painted with a special protective coating.

4.1.6.2.3 Condenser Room

The condenser room secondary containment walls are 0.36- to 0.56-meter-thick reinforced concrete. The secondary containment floor is 0.51-meter-thick reinforced concrete. The condenser room contains all the components of the process condensate system described in Section 4.1.3.1 (refer Figure 4.4), including tank C-100.

Leaks in the condenser room flow to two floor drains that join and route through a 6-inch line to feed tank 241-AW-102. Leaks in the condenser room are detected by the following:

- Unexpected changes in liquid level in tank C-100. Instrumentation is provided to monitor liquid level in the tank, including high- and low-level alarms.
- Daily visual inspections of process condensate system components and piping.

The floor and walls of the condenser room up to an elevation of 1.2 meters are painted with a special protective coating.

4.1.6.2.4 Load out and Hot Equipment Storage Rooms

The load out and hot equipment storage rooms secondary containment walls are 0.30- to 0.56-meter (0.98- to 1.84-feet) thick reinforced concrete. The secondary containment floors are 0.15-meter (0.49-feet) thick reinforced concrete. The room contains two recirculation lines and samplers used to sample the feed and slurry streams. The lines and samplers are located in a shielded enclosure adjacent to the pump room wall.

The load out and hot equipment storage room contains two sumps: the drain sump and decontamination sump. The sumps are 0.91 meter in diameter, about 1.2 meters deep, and lined with stainless steel. Both sumps drain via a 3-inch drain line to the pump room sump described in Section 4.1.6.2.1. The sumps, floor, and walls of the load out and hot equipment storage room up to an elevation of 3.8 meters are painted with a special protective coating.

Leaks in the sampler piping, flow into two drains in the sample enclosure, which drain via a 2-inch line to the decontamination sump, which drains to the pump room sump (described in 4.1.6.2.1). Leak detectors in the sampler enclosures or a rise in the pump room sump level detects leaks in the sampler piping.

4.1.6.2.5 242-A Building Drain Lines

Figure 4.6 provides a simplified process flow schematic of sources routed to the 242-A Building drain lines. The 242-A TSD unit boundary includes these lines up until they exit the 242-A Building. At this point, the lines are considered DST system components. Four lines serve to drain the 242-A Building and equipment to feed tank 241-AW-102:

- Pump room sump drain line (DR-334): a 10-inch carbon steel line that transfers process condensate overflow/diverted liquids and empty out of the pump room sump to the feed tank
- Vapor-liquid separator vessel drain line (DR-335): a 10-inch carbon steel line that allows gravity drain of the vessel to the feed tank
- Condenser room drain line (DR-343): a 6-inch carbon steel line that drains potential leakage from the condenser room.
- Diverted process condensate drain line (DR-338): process condensate liquid drains through DR-338 into sump drain line (DR-334) which drains to 241-AW-102.

The four lines are sloped to drain about 170 meters to feed tank 241-AW-102 via the drain pit (241-AW-02D). Although WAC 173-303-640(1)(c) exempts systems that serve as secondary containment from requiring secondary containment, drain lines DR-334, DR-335, and DR-338 have outer encasement piping.

The drain lines are connected to a cathodic protection system to prevent external corrosion from contact with the soil. The cathodic protection system consists of:

A rectifier that converts supplied alternating current voltage to an adjustable direct current voltage
Numerous anodes buried near the underground piping and connected to the rectifier.
Return wiring that connects the piping to the rectifier, completing the circuit.

The rectifiers are inspected to component degradation has not occurred. Test stations along the system are checked annually to verify 0.85 volt is maintained on the system, as required by the National Association of Corrosion Engineers.

Further detail regarding design and construction of DR-334,-335,-338 and -343 is provided in DOE/RL-90-39 (Hanford Facility Dangerous Waste Permit Application Double-Shell Tank System). Further detail regarding the design, operation, maintenance, and inspection of the cathodic protect system for these lines are also provided in DOE/RL-90-39.

4.1.6.3 Transfer Line Containment

This section describes the design and operation of secondary containment and leak detection systems for transfer lines between the DST System and the 242-A Evaporator, and from 242-A to LERF (one line only, PC-5000). The 242-A TSD boundary for lines running between 242A and the DST System ends at exterior wall of 242-A building. At this point, these lines (e.g., feed and slurry line piping) are DST System components. For further detail regarding SN-269, SN-270, SL-167, and SL-168 refer to DOE/RL-90-39.

The PC-5000 transfer line transfers process condensate (Section 4.1.2) from the 242-A building to LERF. The 242-A TSD unit boundary includes PC-5000 up to the LERF fence line (Chapter 1.0, topographic map, and Section 4.1.2, for the TSD unit boundary)

4.1.6.3.1 Feed Line Piping

Two feed lines (SN-269 and SN-270) (one in service and one spare), each consist of 3-inch transfer piping within a 6-inch secondary containment encasement piping. Both the transfer and encasement pipes are constructed of Schedule 40 carbon steel. The lines run below grade about 120 meters from pump pit 241-AW-02E (above feed tank 241-AW-102) to the 242-A Building.

To detect transfer-piping failures, leak detector risers equipped with conductivity probes are installed on the encasement lines. The transfer piping and encasements are sloped towards the conductivity probe, which, on leak detection, annunciates an alarm in the 242-A Evaporator control room. A valve in the pump pit (241-AW-02E) can be opened to drain solution from the encasement pipe into the pit, which drains to feed tank 241-AW-102.

4.1.6.3.2 Slurry Line Piping

The slurry pump (P-B-2) transfers solution through one of two transfer lines: SL-167, for transfer to valve pit 241-AW-B (standard configuration), or SL-168 for transfer to valve pit 241-AW-A (alternate configuration). Slurry solution can be routed via double-encased piping from these valve pits to any designated DST slurry receiver. Both slurry transfer lines consist of 2-inch transfer piping within a 4-inch secondary containment encasement piping. Both the transfer and encasement pipes are constructed of Schedule 40 carbon steel. The lines run below grade about 73 meters between the 242-A Building and the valve pits.

These slurry lines contain leak detector risers and conductivity probes similar to the feed line piping described in Section 4.1.6.3.1.

4.1.6.3.3 PC-5000

The process condensate transfer line (PC-5000) from the 242-A Evaporator is centrifugally cast, fiberglass-reinforced epoxy thermoset resin pressure pipe fabricated to meet the requirements of ASME D2997 (ASME 1984). The 3-inch (7.6-cm) carrier piping is centered and supported within 6-inch (15.2-cm) containment piping. Pipe supports are fabricated of the same material as the pipe, and meet the strength requirements of ANSI B31.3 (ANSI 1987) for dead weight, thermal, and seismic loads.

Drawing H-2-79604 provides details of the piping from the 242-A Evaporator to LERF.

This permit includes the portion of the PC-5000 line leaving the 242-A Evaporator facility to the fence line of LERF (Chapter 1.0 and topographic maps for unit boundary).

Single-point electronic leak detection elements are installed along the transfer line at 305-meter (1000 foot) intervals. The leak detection elements are located in the bottom of specially designed test risers. Each sensor element employs a conductivity sensor, which provides a signal to the

242-A Evaporator control room when a potential leak is detected. If a leak develops in the carrier pipe, fluid will travel down the exterior surface of the carrier pipe or the interior of the containment pipe. As moisture contacts a sensor unit, a general alarm sounds in the 242-A Evaporator control room on the Monitoring Control System. In addition, the zone of the sensor unit causing the general alarm can be determined using the leak detection-monitoring panel. Upon verification of a leak, the pump located in the 242-A Evaporator is shut down, stopping the flow of aqueous waste through the transfer line. A low-volume air purge of the annulus between the carrier pipe and the containment pipe is provided to prevent condensation buildup and minimize false alarms by the leak detection elements.

If a leak is detected using visual inspection of the PC-5000 transfer line encasement at the encasement catch tank (TK-PC-101) in the LERF catch basin (242AL-43), the shift manager is notified. The Shift Manger will direct shutdown of the aqueous waste through the PC-5000 transfer line.

4.1.6.4 Additional Requirements for Specific Types of Systems

Addressed in this section are additional requirements in WAC 173-303-640 for vault systems like the 242-A Building to ensure neither buildup of ignitable vapors nor does infiltration of precipitation occur. This section also addresses secondary containment for ancillary equipment and piping associated with the tank systems.

4.1.6.4.1 Vault Systems

The 242-A Building is a vault constructed partially below ground, providing secondary containment for the tank systems. The DST System waste processed at the 242-A Evaporator is designated ignitable and reactive because of the presence of nitrite and nitrate salts, which are considered oxidizers per 49 CFR 173. Because of their low volatility, these compounds are unlikely to be present in the vapor phase of the tank systems at the 242-A Evaporator. However, to prevent the spread of contamination, the vapor-liquid separator (C-A-1) is ventilated and maintained at lower air pressure than the building air space. This ensures air leakage is from uncontaminated building air space into the tank vapor space. Vapors from the vapor-liquid separator flow to the vacuum condenser system described in Section 4.0.

The condensate collection tank (C-100), collects process condensate that is not designated ignitable or reactive.

The tank systems and ancillary equipment are located within the 242-A Building, which is completely enclosed to prevent run-on and infiltration of precipitation into the secondary containment system.

4.1.6.4.2 Ancillary Equipment

The 242-A Building provides secondary containment for ancillary equipment. Double containment is provided for the feed and slurry transfer lines between the 242-A Building and the AW Tank Farm by pipe-in-pipe arrangements. Therefore, all ancillary equipment has secondary containment and the daily inspection requirements in WAC 173-303-640(4)(f) are not applicable.

4.1.7 Variances from Secondary Containment Requirements

The integrity assessment report (Appendix 4B) discusses the following three deficiencies associated with the secondary containment system:

Pump Room Sump. The pump room sump does not comply with secondary containment requirements because liquid must be kept in the sump to provide a seal to prevent airflow between the pump room and feed tank 241-AW-102. Although the sump has a 0.63-centimeter (0.25-inch)-thick stainless steel liner to prevent corrosion of the concrete floor, the sump does not have secondary containment.

Routine Discharges through Secondary Containment. The configuration of the 242-A Evaporator process requires routine, batch discharges of dangerous waste through secondary containment drain lines. These routine discharges include the following.

- Steam condensate, cooling water, and process condensate sample stations drain to the feed tank, 241-AW-102, through drain line DR-343. Total discharge is about 38 liters (10 gallons) per month during operation.
- Sample bottle water sprays down in the feed and slurry sample stations drain to the decontamination sump in the load out and hot equipment storage room. The decontamination sump then drains to the pump room sump. Total discharge is about 76 liters per month during operation.

Transfer Piping Wall Penetrations. Three dangerous waste transfer line piping sections passing through the 242-A Building wall are single-walled, i.e., no secondary confinement in the wall (about 56-centimeter-thick reinforced concrete).

These deficiencies were identified to Ecology, October 28, 1993. Ecology's response stated, "No physical revision of the pipe wall penetrations or the floor drains in the evaporator pump room will be required prior to evaporator restart". The response required the following.

- If at any time leakage is seen or detected from these installations, or if for any reason these installations are repaired or rebuilt, they will be rebuilt or repaired in accordance with regulations.
- Should a spill occur in the evaporator pump room the sump and the piping shall be rinsed three times as required in WAC 173-303-160. 'Appropriate' in this case means that the original regulation was written for a free container, not a sump, so that judgment will have to be used in the application of the regulation. The rinsate shall be transferred to the double-shell tanks.

4.1.8 Tank Management Practices

All waste to be processed at the 242-A Evaporator must be sampled to determine if the waste is compatible with the materials of construction at the 242-A Evaporator. Before each campaign, candidate feed tanks are sampled per the requirements of the waste analysis plan (Chapter 3.0). Based on the results, three possible options are implemented.

- The waste is acceptable for processing without further actions.
- The waste is unacceptable for processing as a single batch, but is acceptable if blended with other waste that is going to be processed.
- The waste is unacceptable for processing.

The 242-A Evaporator process is controlled by the MCS. The MCS computer monitors liquid levels in the vapor-liquid separator (C-A-1) and condensate collection tank (C-100). The MCS system manages liquid levels in the C-A-1 using an auto-cascade function that controls feed delivery to the C-A-1 vessel. The MCS system also manages liquid levels in the C-100 using an auto-cascade function to maintain the tank level at approximately 50-percent. The MCS has alarms that annunciate on high-liquid levels for both C-A-1 and C-100 to notify operators that actions must be taken to prevent overfilling of these vessels.

An interlock is activated when high-liquid level in the vapor-liquid separator (C-A-1) is detected, automatically shutting down the feed transfer pump at feed tank 241-AW-102, thereby preventing overfilling of the vessel and carryover of slurry into the process condensate system. The condensate collection tank (C-100) has an overflow line that routes solution to feed tank 241-AW-102 in case of overfilling.

Process and instrumentation drawings are listed in Section 4.3.

The MCS also provides an automated interlock to shutdown the recirculation pump (P-B-1) and slurry pump (P-B-2) if a leak is detected. The recirculation pump (P-B-1) and slurry pump (P-B-2) will be shutdown automatically using the MCS interlock and/or manually at the direction of the Shift Manager or 242-A Evaporator Control Room Operator if a leak occurs. The process condensate pump (P-C-100) will be shut down manually at the direction of the Shift Manager or 242-A Evaporator Control Room Operator if a leak occurs.

4.1.9 Labels or Signs

A labeling upgrade was completed before restart in 1994 for tank C-100 to identify the waste contents and major risks associated with waste stored within the tank. Tank C-100 ancillary piping is labeled "PROCESS CONDENSATE" to alert trained personnel which pipes in the condenser room contain dangerous waste. The vapor-liquid separator (C-A-1) is located in the evaporator room, a normally unoccupied area. This area is posted as a high radiation area with ALARA access controlled and limited to trained personnel only. The tank labels are visible from the walls of the tank enclosure rooms, which are less than 15 meters from the tank systems; therefore, label visibility requirements are met.

4.1.10 Air Emissions

Tank systems that contain extremely hazardous waste, and is acutely toxic by inhalation must be designed to prevent the escape of such vapors. The DST System waste in the vapor-liquid separator, C-A-1, is designated extremely hazardous waste; however, no determination has been performed to determine if the waste is acutely or chronically toxic. Most of the toxic compounds in the DST waste are not volatile, but because of the high radioactivity of the waste, controls are included to prevent or mitigate the release of tank vapors. The vapor-liquid separator is maintained under vacuum to ensure air leakage is from uncontaminated building air space into the tank vapor space. The boiling vapor in C-A-1 passes through deentrainment pads and sprays to prevent liquid and solid carryover into the vapor section of the tank. The vapor stream passes through three condensers that remove the condensable components. The noncondensable vapors pass through HEPA filters before being discharged to the environment.

4.1.11 Management of Ignitable or Reactive Wastes in Tank Systems

Although the DST System waste reprocessed at the 242-A Evaporator is designated ignitable because of the presence of oxidizers (nitrates and nitrites), the waste does not meet the definition of a combustible or flammable liquid given in National Fire Protection Association (NFPA) code number 30 (NFPA 1996). The buffer zone requirements in NFPA-30, which require tanks containing combustible or flammable solutions be a safe distance from each other and from public way, are not applicable.

An analysis is performed on the DST System waste to be processed to verify the waste does not react exothermically at the elevated temperatures at the 242-A Evaporator. The waste analysis plan (Chapter 3.0) discusses waste acceptance requirements due to reactive waste designation.

4.1.12 Management of Incompatible Wastes in Tank Systems

Waste transferred to the 242-A Evaporator must be compatible before mixing. The waste analysis plan (Chapter 3.0) includes waste compatibility requirements.

4.2 AIR EMISSIONS CONTROL

This section addresses the requirements of Air Emission Standards for Process Vents, under Subpart AA (incorporated by reference in WAC 173-303-690).

4.2.1 Applicability of Subpart AA Standards

The 242-A Evaporator performs distillation that specifically requires evaluation of process vents for the applicability of 40 CFR 264 Subpart AA.

Waste processed at the 242-A Evaporator routinely contains greater than 10 parts per million organic concentrations; therefore, organic air emissions are subject to 40 CFR 264.1032, which requires organic emissions from all affected vents at the Hanford Facility be less than 1.4 kilograms per hour and 2.8 megagrams per year, or control devices be installed to reduce organic emissions by 95%.

The 242-A Evaporator has one process ventilation system that vents both the vapor-liquid separator (C-A-1) and the condensate collection tank (C-100). The vent lines from both tanks combine before entering an off-gas system consisting of a deentrainer, a prefilter/demister, HEPA filters, and an exhaust fan. The vessel vent off-gas system is located on the third floor of the condenser room, with the

exhaust stack extending horizontally through the east wall of the building at an elevation of 14.7 meters above ground level. The exhaust stack bends to run vertically with the discharge point 18.6 meters above ground level.

The annual average flow rate for the vessel vent is given in *Radionuclide Air Emissions Report for the Hanford Site - Calendar* Year *1995* (DOE-RL 1996) as 18 cubic meters per minute and the total annual flow was 9.6 E+06 cubic meters. During waste processing, the airflow is about 20.5 cubic meters per minute, with about 4.3 cubic meters per minute ventilated from tank C-100 and the remainder from the vapor-liquid separator and air in leakage.

Organic emissions occur during waste processing, which is less than 6 months (182 days) each year. This is the maximum annual operating time for the 242-A Evaporator, as shutdowns are required during the year for maintenance outages, candidate feed tank analysis, and establishing transfer routes for staging waste in the DST System. The total operating time for the two campaigns in 1994 was 86 days.

4.2.2 Process Vents - Demonstrating Compliance

This section outlines how the 242-A Evaporator complies with the requirements of 40 CFR 264, Subpart AA, including a discussion of the basis for meeting the organic emission limits, calculations demonstrating compliance, and conditions for reevaluating compliance.

4.2.2.1 Basis for Meeting Limits/Reductions

The TSD units at the Hanford Facility subject to 40 CFR 264, Subpart AA meet the organic air emission limits of 1.4 kilograms per hour and 2.8 megagrams per year, established in 40 CFR 264.1032, by the design of the facility. The 242-A Evaporator and the other TSD units collectively can meet these standards without the use of air pollution control devices.

4.2.2.2 Demonstrating Compliance

Process vent organic air emissions are controlled by establishing limits for acceptance of waste at the 242-A Evaporator. Before startup of each campaign, the waste to be processed is sampled in the DST System to determine the organic content. If the concentrations of organic constituents are less than the limits in the waste analysis plan (Chapter 3.0), the waste can be processed, provided the Hanford Facility will not exceed 1.4 kilograms per hour and 2.8 megagrams per year. The waste acceptance limits in the waste analysis plan are based on equilibrium calculations and assumptions given in *Organic Emission Calculations for the 242-A Evaporator Vessel Vent System* (WHC 1996). The calculation to determine organic emissions consists of the following steps:

1. Determine the emission rate of each candidate feed tank organic constituent by multiplying the constituent concentration by the corresponding partition factor in *Organic Emission Calculations for the 242-A Evaporator Vessel Vent System* (WHC 1996).

2. Sum the emission rates of all organic constituents to determine the emission rate for the candidate feed tank. The maximum emission rate for the campaign is the rate from the candidate tank with the greatest emission rate.

3. Determine the total amount of emission during the campaign by using operating time and a weighted average emission rate, based on the volume of each candidate feed tank processed.

The organic emission rates and quantity of organics emitted during the campaign are determined using these calculations and are included in the operating record for each campaign, as required by 40 CFR 264.1035. The Hanford Facility has a system to ensure organic emissions from units subject to 40 CFR 264, Subpart AA are less than the limits of 1.4 kilograms per hour and 2.8 megagrams per year. Records documenting total organic emissions are available for Ecology review on request.

4.2.2.3 Reevaluating Compliance with Subpart AA Standards

Calculations to determine compliance with Subpart AA will be reviewed when any of the following conditions occur at the 242-A Evaporator:

- Changes in the configuration or operation that affect the assumptions in the Organic Emission Calculations for the 242-A Evaporator Vessel Vent System (WHC 1996)
- Annual operating time exceeds 182 days

4.3 ENGINEERING DRAWINGS

The drawings in Table 4.1 are process and instrumentation diagrams for the systems at the 242-A Evaporator that contact mixed waste. These drawings are provided for general information, and demonstrate adequacy of the tank systems design.

Table 4.1. Process and Instrumentation Diagrams

System	Drawing Number	Drawing Title
Vapor-Liquid Separator	H-2-98988 Sheet 1	P & ID Evaporator Recirc System
Reboiler/Recirculation Line	H-2-98988 Sheet 2	P & ID Evaporator Recirc System
Slurry System	H-2-98989 Sheet 1	P & ID Slurry System
Condensate Collection Tank	H-2-98990 Sheet 1	P & ID Process Condensate System
Secondary Containment Drain System	H-2-98995 Sheet 1	P & ID Drain System
Secondary Containment Drain System	H-2-98995 Sheet 2	P & ID Drain System
Condensers	H-2-98999 Sheet 1	P & ID Vacuum Condenser System
Pump Room Sump	H-2-99002 Sheet 1	P & ID Jet Gang Valve System
Condensate Recycle System	H-2-99003 Sheet 1	P & ID Filtered Raw Water System
Process Condensate Line PC-5000	H-2-79604	Piping Plot for PC-5000 between 242 A and the LERF fence line

The drawings in Table 4.2 are for secondary containment systems for the 242-A Evaporator. Because secondary containment systems are the final barrier for preventing the release of dangerous waste into the environment, modifications that affect the secondary containment systems will be submitted to the Washington State Department of Ecology, as a Class 1, 2, or 3 Permit modifications, as required by WAC 173-303-830.

Table 4.2. 242-A Evaporator Secondary Containment Systems Drawings

System	Drawing Number	Drawing Title
242-A Building	H-2-69277 Sheet 1	Structural Foundation Plan Sections & General Notes - Areas 1 & 2
	H-2-69278 Sheet 1	Structural Foundation Elevations & Details - Areas 1 & 2
	H-2-69279 Sheet 1	Structural First Floor Plan & AMU - Areas 1 & 2
Pump Room Sump Drainage	H-2-69352 Sheet 1	Sections Process Waste Drainage
242-A Building Drainage	H-2-69354 Sheet 1	Plan Process Waste Drainage
Pump Room Sump	H-2-69369 Sheet 1	Pump Room Sump Assembly & Details

Figure 4.1. 242-A Evaporator Simplified Process Flow Diagram

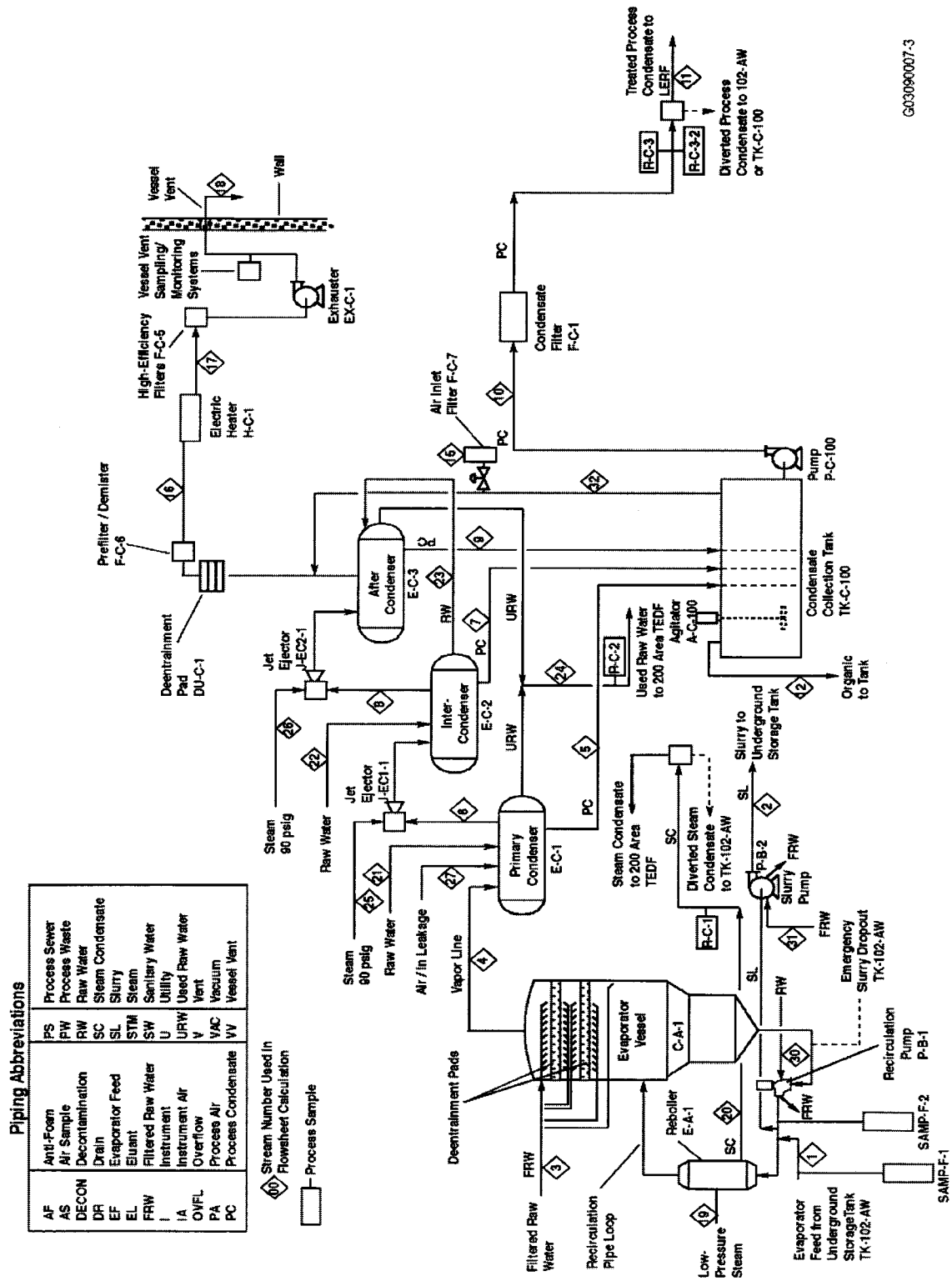


Figure 4.2. 242-A Evaporator Process Loop

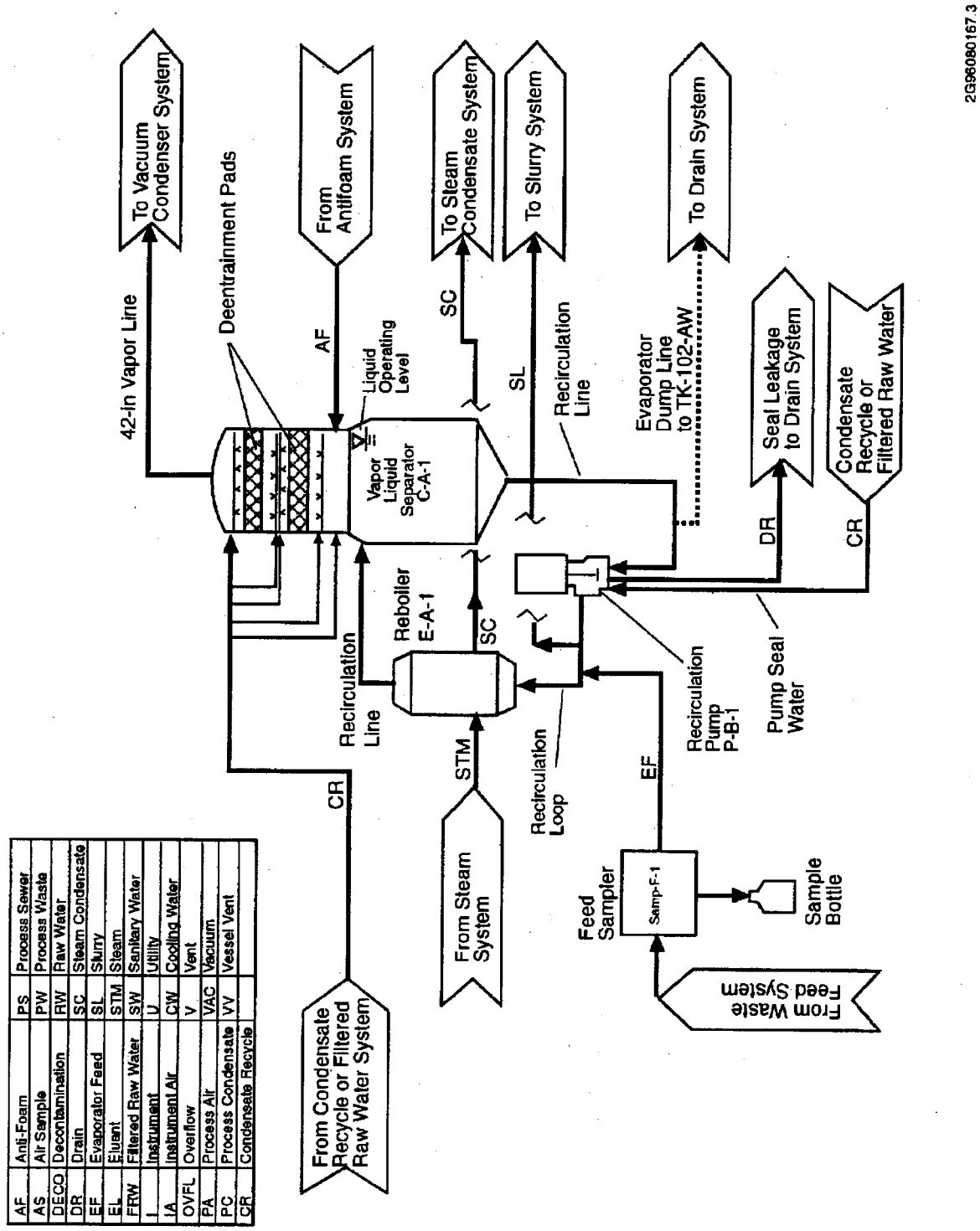


Figure 4.3. 242-A Evaporator Slurry System

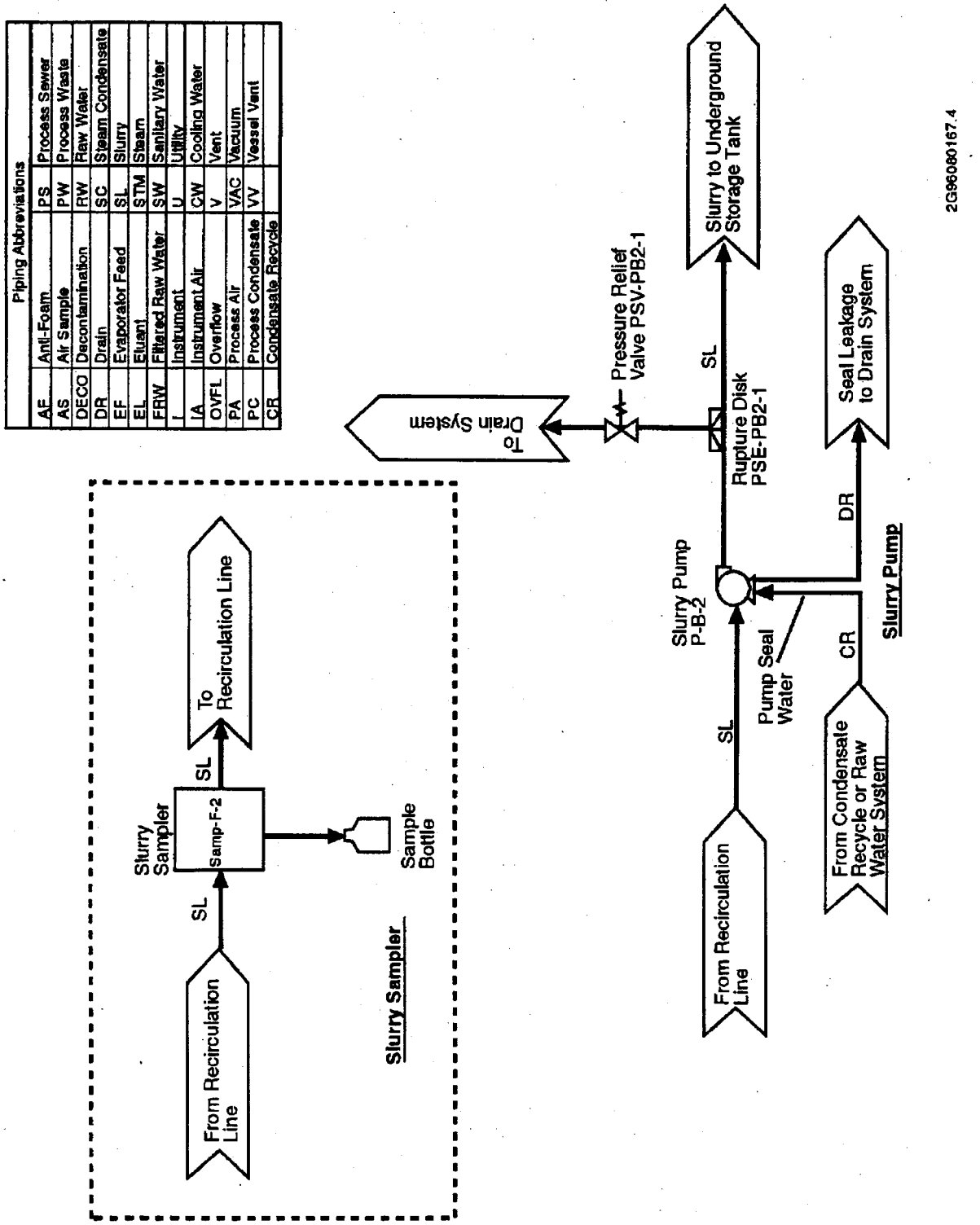


Figure 4.4. 242-A Evaporator Process Condensate System

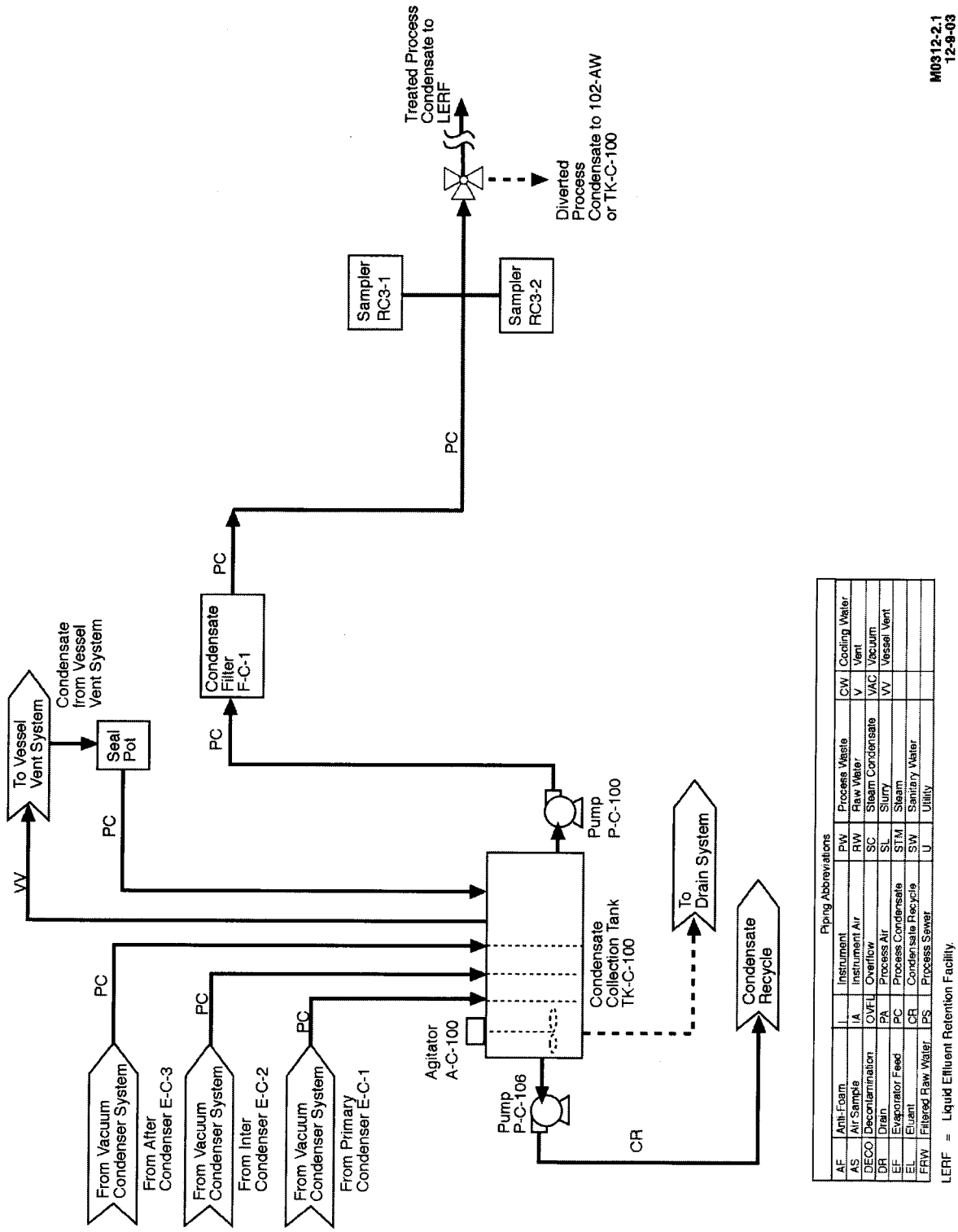


Figure 4.5. 242-A Evaporator Vacuum Condenser System

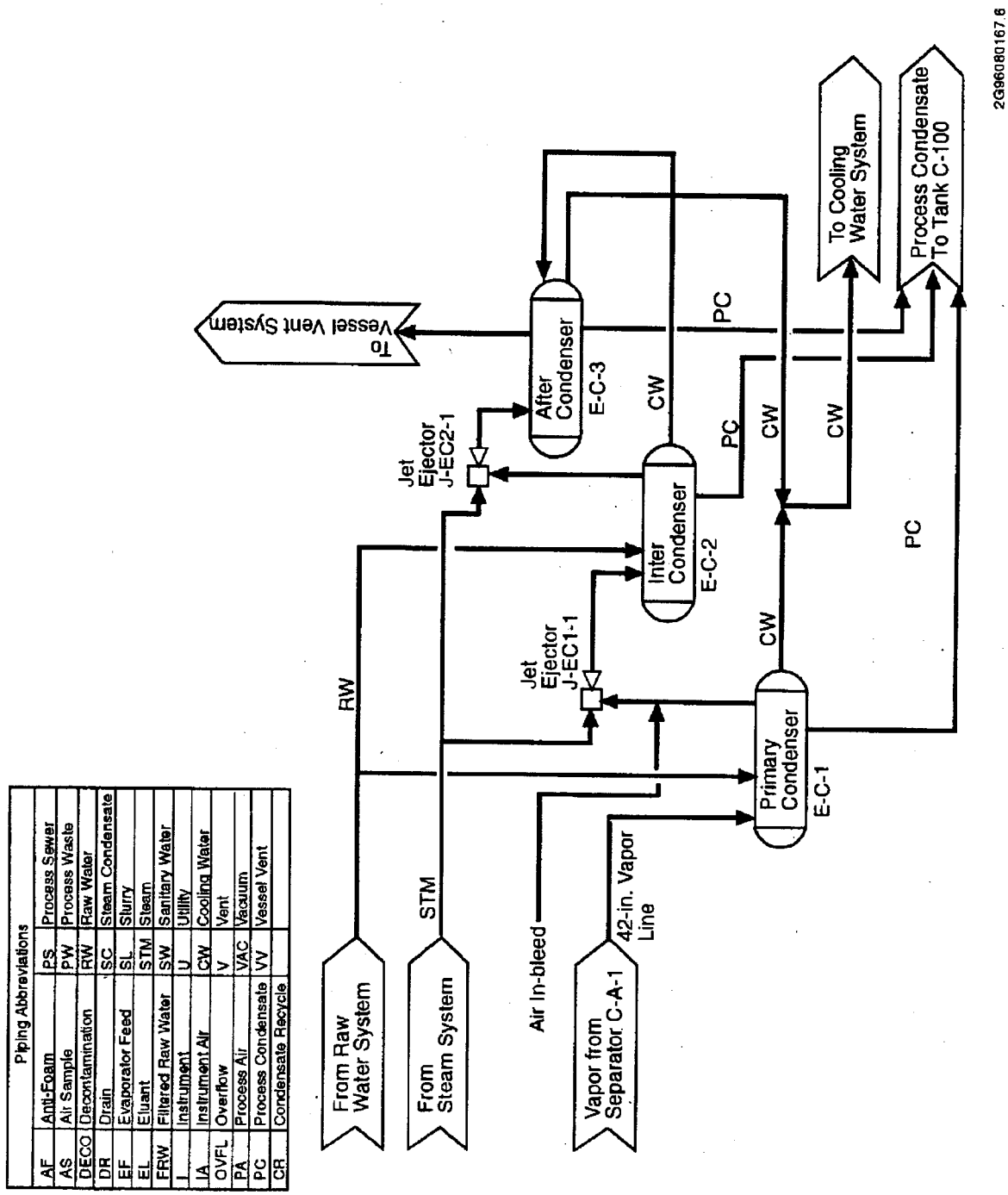
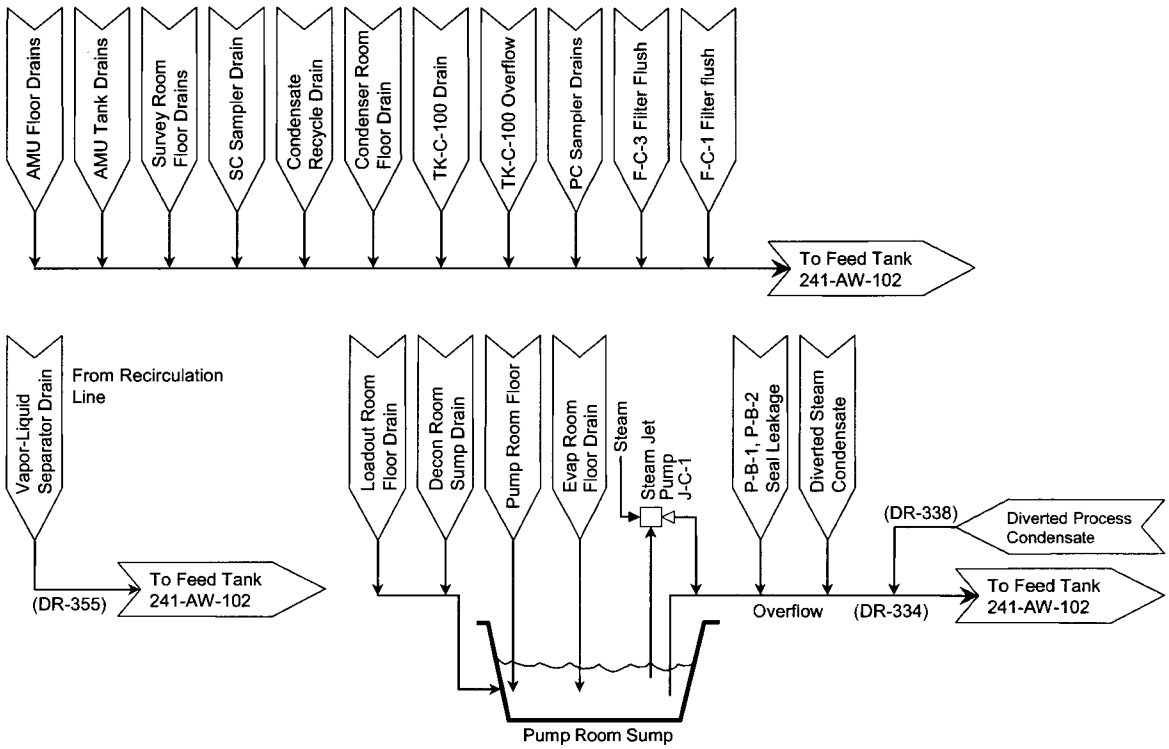


Figure 4.6. 242-A Evaporator Drain System



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Chapter 6.0 Procedures to Prevent Hazards

6.0 PROCEDURES TO PREVENT HAZARDS 6.1

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6.0 PROCEDURES TO PREVENT HAZARDS

This chapter discusses security, inspection schedules, preparedness and prevention requirements, preventive procedures, structures, and equipment, and prevention of reaction of ignitable, reactive, and incompatible waste for the 242-A Evaporator.

Where information regarding treatment, management, and disposal of the radioactive source, byproduct material, special nuclear material (as defined by the Atomic Energy Act of 1954, as amended) and/or the radionuclide component of mixed waste has been incorporated into this permit, it is not incorporated for the purpose of regulating the radiation hazards of such components under the authority of this permit or chapter 70.105 RCW.

6.1 SECURITY

Refer to Permit Attachment 33, §6.1 Security.

6.1.1 Waiver

A waiver of security procedures and equipment requirements is not requested for the 242-A Evaporator. Therefore, the waiver requirements outlined in WAC 173-303-310(1)(a) and (b) are not applicable.

6.2 INSPECTION PLAN

This section describes the method and schedule for inspections of the 242-A Evaporator. The purpose of inspections is to identify situations that might cause or lead to a release of mixed waste that could pose a threat to human health and the environment. Abnormal conditions identified by an inspection must be corrected on a schedule that prevents hazards to the public and environment.

6.2.1 General Inspection Requirements

This section provides an overview of inspections performed at the 242-A Evaporator. A copy of the inspection plan is kept in the 242-A Evaporator control room. There are three general classes of inspections at the 242-A Evaporator:

- Monitoring of remote instrumentations and alarms are performed by operating personnel in the 242-A Evaporator control room using the MCS computer.
- Visual inspections of tanks and equipment are performed by operating personnel. Some inspections of fire protection equipment, such as sprinkler system inspections, are performed by the Hanford Fire Department.
- Preventive maintenance of equipment and calibration of instruments are performed by maintenance personnel. A computerized tracking system is used to identify and schedule preventive maintenance and calibration activities.

Preventive maintenance and instrument calibrations on certain equipment might not be possible when the 242-A Evaporator is operating. Because of the limited duration of 242-A Evaporator campaigns, these activities are scheduled during outages between campaigns to avoid interference with operating activities.

6.2.1.1 Types of Problems

The 242-A Evaporator inspections include, but are not limited to, the following:

- Condition of tanks and ancillary equipment
- Condition of secondary containment
- Evidence of leaks or overflows from tanks, piping, or transfer lines

- Condition of security equipment
- Condition of safety, communications, and emergency equipment.

A schedule of inspections, including items to be inspected, problems to look for, frequency of inspections and responsible organization are provided in Tables 6.1 through 6.4.

6.2.1.2 Frequency of Inspections

The frequency of inspections is based on the significance of a failure of the equipment and on regulatory requirements, Hanford Site and industry standards, and experience of the nature and frequency of equipment failures.

- The frequency of inspections for the 242-A Evaporator is given in Tables 6.1 through 6.4. Examples of frequencies include:
- Daily (at least every 24 hours) - visual inspections of tanks, piping and secondary containment.
- Weekly (at least every 7 days) - visual inspections of personal protective equipment, exterior lighting, and posted warning signs.
- Monthly (at least every 31 days) - inspections of emergency sirens, fire extinguishers, safety showers, emergency lighting and the spill control kit.
- Annually (at least every 365 days) - instrumentation calibrations, cathodic protection system testing, fire inspections.

Leak detectors are functionally checked within 92 days of the start of a campaign and every 92 days thereafter until the campaign is over. The frequency of some alarm monitoring is continuous. This means an operator must be present in the control room to monitor alarm instruments that continuously check for conditions such as leaks and high sump levels. Continuous monitoring is only required when the 242-A Evaporator is processing waste

6.2.2 Tank System Inspections and Corrective Actions

This section discusses the inspections performed on the two tank systems at the 242-A Evaporator: the vapor-liquid separator, C-A-1, and the condensate collection tank, C-100. Inspections include secondary containment and leak and overfill prevention equipment.

6.2.2.1 Overfill Prevention

The vapor-liquid separator, C-A-1, is equipped with instrumentation that alarms before the tank reaches a level where the tank could overflow or entrain liquid waste into the vacuum condenser system. The alarm annunciates in the control room allowing operating personnel to take immediate action to stop the vapor-liquid separator from overfilling.

The condensate tank, C-100, was designed with an overflow line that routes waste to the feed tank, 241-AW-102. This design prevents tank overflow to the condenser room.

6.2.2.2 Visual Inspections

Visual inspections of tanks and secondary containments are performed to check for leaks, signs of corrosion or damage, and malfunctioning equipment. Inspections also include housekeeping checks to ensure aisle space requirements are met. The following rooms containing dangerous waste are inspected:

- Condenser room
- Pump room
- Hot equipment storage room
- Load out room

In addition, the AMU room is inspected when hazardous materials are present in the room.

The vapor-liquid separator is located in the evaporator room, with a portion of the recirculation loop located in the pump room. Because of the high radiation dose in the evaporator room, visual inspections cannot be performed. Leaks in the evaporator room drain to the pump room sump; monitoring of the pump room sump instrumentation is performed to determine if leaks have occurred. Visual inspection of the portion of the recirculation loop located in the pump room is performed through the shielding window on the AMU mezzanine.

6.2.2.3 Leak Detectors

The sample enclosures in the load out and hot equipment storage room have leak detectors for both the feed and slurry samplers. For information on these systems and their secondary containment, refer to Chapter 4.0, §4.1.4.

Leaks to secondary containment in the evaporator room, pump room, hot equipment storage room, and load out room drain to the pump room sump. The sump high-level alarm serves as a leak detector for these rooms. For information on the rooms and their drain systems, refer to Chapter 4.0, §4.1.4.

There are conductivity probe leak detectors installed in the secondary containment of the feed transfer line, slurry line, and drain lines connecting the 242-A Evaporator to AW Tank Farm. However, these detectors are considered part of the DST System.

The PC-5000 transfer line may be continuously monitored during transfers by an electronic leak detection system (Chapter 4.0) or visually inspected at the encasement catch tank (TK-PC-101) in the LERF catch basin (242AL-43). The leak detection system alarms are monitored in the 242-A Evaporator Control Room on the Monitoring and Control System (§4.1.6.3.3). When necessary, visual inspections of the PC-5000 transfer line encasement are administratively controlled by the Shift Manager and occur at a minimum once every 24 hours during waste water transfers through the PC-5000 transfer line to ensure compliance with WAC 173-303-640(4)(c)(iii). Visual inspection for leaks from the PC-5000 transfer line are performed by 242-A Evaporator Operations, by looking for signs of any liquid not attributed to rain/precipitation at the encasement catch tank (TK-PC-101). If any liquid is observed the Shift Manager is notified to take corrective actions.

6.2.2.4 Cathodic Protection

Cathodic protection is not required for the equipment within the 242-A facility boundaries. The only portion of the system, which is underground is the PC-5000 transfer line. The PC-5000 line is constructed of fiberglass.

6.2.2.5 Tank Assessments

The IAR was issued in 1998. The frequency and nature of these assessments are discussed in the IAR.

6.2.3 Storage of Reactive and Ignitable Wastes

The Hanford Fire Department performs annual fire inspections of the 242-A Evaporator using a checklist developed specifically for facilities that handle dangerous and/or mixed waste. The checklist was developed from requirements in the Uniform Fire Code and the National Fire Protection Association code. A copy of the completed checklist is given to operating management to take remedial actions for any problems identified. The completed checklist is included in the operating record and also is available from the Hanford Fire Department.

6.2.4 Air Emissions Control and Detection Inspections

The process vent at the 242-A Evaporator is subject to 40 CFR 264, Subpart AA, which requires organic emissions be limited to 1.4 kilograms per hour, and 2.8 megagrams per year, or controls be installed to reduce organic emissions by 95 percent. Organic concentrations in the waste processed at the 242-A Evaporator are limited to ensure the values of 1.4 kilograms per hour and 2.8 megagrams per year

are not exceeded. Therefore, no emission control devices are installed on the 242-A Evaporator vessel ventilation system and no inspections are required (Chapter 4.0, §4.2).

6.2.5 Inspection Logs

- Visual inspections (refer to Tables 6.1-6.4) are performed using inspection log sheets (also called round sheets) that outline frequency, the components to inspect, operating conditions and ranges, and types of problems. Log sheets are kept in the 242-A Evaporator control room. Inspectors record the following information:
- Date and time of the visual inspection
- Printed name and signature of the person performing the inspection
- Notations of the observations made, including space for writing comments
- An account of spills or discharges in accordance with WAC 173-303-145.

Completed log sheets are reviewed and approved by the shift supervisor, collected, and stored for at least 5 years.

Maintenance inspections are performed as part of the maintenance job control system. After completion, the maintenance documentation is reviewed and signed.

6.2.6 Schedule for Remedial Action for Problems Revealed

If while performing a visual inspection (Table 6.1), a leak or spill is discovered, facility management responds immediately per Chapter 7.0, Contingency Plan. Action is taken to stop the leak and determine the cause. The waste is removed from the secondary containment within 24 hours or in a timely manner that prevents harm to human health and the environment. For spills that drain to the pump room sump, the sump must be emptied and rinsed three times (Chapter 4.0, §4.1.5).

If an alarm activates during inspections, an operator responds immediately and implements appropriate actions.

If an inspection identifies equipment that is missing, damaged, or not operating properly, the operator records the problem on a deficiency log in the 242-A Evaporator control room. Repair work is prioritized by facility management to mitigate health risks to workers, maintain integrity of the facility, and prevent hazards to public health and the environment. The Hanford Fire Department repairs fire prevention equipment.

6.3 PREPAREDNESS AND PREVENTION REQUIREMENTS

The following sections document the preparedness and prevention measures taken at the 242-A Evaporator.

6.3.1 Equipment Requirements

The following sections describe the internal and external communications and emergency equipment located at the 242-A Evaporator that can be activated by the 242-A Evaporator BED. Hanford Facility-wide equipment is identified in Permit Attachment 4, *Hanford Emergency Management Plan* (DOE/RL-94-02).

6.3.2 Internal Communications

The 242-A Evaporator is equipped with internal communication systems to provide immediate emergency instruction to facility personnel. The onsite communication systems at the 242-A Evaporator include telephones, hand-held two-way radios, a public address system, and alarm systems. The telephone and

radio systems provide for internal and external communication. Alarm systems allow facility personnel to appropriately respond to various emergencies, including building evacuations, take cover events, fires and/or explosions. The locations of telephones, public address systems, and alarms are given in the Chapter 7.0, Contingency Plan.

Immediate emergency instruction to personnel is provided by a public address system using speaker horns and speakers located throughout the 242-A and 242-AB Buildings and outside.

6.3.2.1 External Communications

The 242-A Evaporator is equipped with devices for summoning emergency assistance from the Hanford Fire Department, the Hazardous Materials Response Team, and/or local emergency response teams, as necessary. External communication is made through the normal system In addition, the following systems are available for external communication with persons assigned to emergency response organizations:

- A crash alarm telephone is available in the 242-A Evaporator control room. The crash alarm telephone system provides communication of centralized emergency response instructions to 242-A Evaporator personnel
- Fire alarm pull boxes Fire alarm pull boxes and fire sprinkler flow monitoring devices are connected to a system monitored around the clock by the Hanford Fire Department
- Telephone number 911 (811 if using a cellular phone) is the contact point for the Hanford Site; on notification, the Hanford Patrol Operations Center notifies and/or dispatches required emergency responders
- Telephone number 373-3800 is the single point of contact for the Hanford Site emergency duty officer; this number can be dialed from any Hanford telephone

During certain periods, only one operator may be available within the 200 East plateau. This operator has access to external communication using telephones located throughout the building.

6.3.2.2 Emergency Equipment

Emergency equipment is available throughout the 242-A Building. The locations of telephones, public address systems, and alarms are given in Chapter 7.0, Contingency Plan.

Major fire damage is unlikely at the 242-A Evaporator because of the concrete construction and because the amount of combustible material is minimized. Temperature-activated water sprinkler systems, emergency lights, fire alarms pull boxes, and fire extinguishers are located throughout the facility. The Hanford Fire Department is capable of providing rapid response to major fires at the 242-A Evaporator and its vicinity, with a fire hydrant located near the east side of the facility.

Safety showers are located in the areas where personnel are most likely to have direct exposure of hazardous materials: in the AMU room and on the first and fourth floors of the condenser room. Water for these devices is supplied from the sanitary water system. Self-contained breathing apparatus units are available in the control room for use throughout the 242-A Building for protection from radiological hazards and are not subject to the HF RCRA Permit provisions.

Respirators are located in the PPE storage room near the entryway to the condenser room. Other PPE, such as hazardous material protective gear and special work procedure clothing, are located in cabinets in the survey area. If required, PPE is donned before entry into the rooms containing mixed waste. The level of personal protective equipment required depends on the level of contamination in the area being entered and the activity being performed.

A spill control kit is located in a cabinet near the door to the PPE storage room. An inventory of the equipment in the spill kit is included inside the cabinet. The spill kit cabinet door seal is checked monthly to ensure the kit has not been used. The kit inventory is inspected annually.

The 242-A Evaporator operating personnel are trained in the use of emergency equipment (Chapter 8.0).

6.3.2.3 Water for Fire Control

Water for fire protection is supplied from the 200 East Area raw water system. Columbia River water is supplied to the fire control system from the 282-E Water Supply Reservoir. The water distribution system is sized to provide adequate volume and pressure to supply fire fighting needs under normal and emergency conditions. A fire hydrant is located in the immediate proximity of the 242-A Building.

In the event that the sprinkler system at the 242-A Evaporator does not put out a fire, or the sprinkler system is damaged during an accident, the Hanford Fire Department fire station will provide equipment as described in Permit Attachment 4, *Hanford Emergency Management Plan (DOE/RL-94-02)*

6.3.3 Aisle Space Requirement

Sufficient aisle space is maintained on the exterior of the 242-A Evaporator to allow access of personnel and equipment responding to fires, spills, or other emergencies. Unobstructed fire lanes run from Fourth Street and Canton Avenue to the 242-A Building main entrance to allow emergency vehicle access to the main entrance and the nearby fire hydrant.

The 242-A Building interior aisle space is designed to allow access by emergency response personnel while maintaining barriers to contain releases of gaseous or liquid waste and hazardous material. Walkways in the rooms containing mixed waste are checked daily to ensure the walkways have not been obstructed by portable equipment, trash, etc.

6.4 PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT

The following sections describe preventive procedures, structures, and equipment.

6.4.1 Loading and Unloading Operations

The feed transfer and slurry lines between the 242-A Evaporator and AW Tank Farm are constructed of carbon steel piping with secondary containment and leak detection in a pipe-within-a-pipe arrangement. Although the regulations exempt systems that serve as secondary containment from requiring secondary containment, two of the drain lines from the 242-A Evaporator to AW Tank Farm also have outer encasement piping and leak detection (refer to Chapter 4.0, §4.1.4, for information on these lines).

Waste transfers within the 242-A Building are contained by the secondary containment walls, floors and drains (refer to Chapter 4.0, §4.1.4, for information on secondary containment at the 242-A Evaporator).

Mixed waste storage containers are not loaded or unloaded at the 242-A Evaporator. Unloading operations occur when equipment contaminated with mixed waste exits the facility. Such materials are fully sealed in plastic with absorbent material to absorb any free liquid present. Because of these requirements, the likelihood of a spill outside the 242-A Building during this operation is extremely low.

6.4.2 Run-Off

Liquid waste handling at the 242-A Evaporator occurs within tank systems with secondary containment. Rooms containing mixed waste have drains that route to either the pump room sump or the feed tank, 241-AW-102. The pump room sump overflows to the feed tank as well. Therefore, run-off from a major leak, such as a break in a large water line within the 242-A Building, would be contained within the facility or drained to the feed tank (refer to Chapter 4.0, §4.1.4 for information on secondary containment and drain systems).

6.4.3 Water Supplies

Raw and sanitary Columbia River water are supplied to the 242-A Evaporator via separate underground lines from the 282-E Water Supply Reservoir. Raw water is filtered to prevent organisms and other debris from clogging valves, fire hydrants, and other equipment. Sanitary water is filtered and treated before distribution through a piping system separate from the raw water system.

The raw water supply to the 242-A Evaporator enters the 242-A-81 Water Service Building, passing through a strainer and backflow preventer before entering the facility. The backflow preventer ensures contaminated water cannot flow back into the raw water system. A second backflow preventer is installed in the 242-A Building on the raw water supply line connecting with the condensate recycle line. This system allows either raw water or process condensate to be used for the pump seal water and deentrainment pad spray water without risk of contamination of the raw water system.

The sanitary water system provides water to the lunchroom, drinking fountains, men's and women's change rooms, safety showers, and supply ventilation system air washers. There are no connections between sanitary water and any system or piping containing mixed waste.

6.4.4 Equipment and Power Failures

Backup power is provided by a diesel generator. The diesel motor starts automatically on loss of electrical power and has sufficient fuel to operate the generator to safely shut down the evaporator process. An uninterruptible power supply system also is provided to allow continued operation of the MCS computer to ensure uninterrupted monitoring until the emergency generator is fully on line.

The 242-A Evaporator is designed to mitigate the effects of failure of a major piece of equipment. In general, the evaporator process can be shut down and the vapor-liquid separator gravity-drained to the feed tank, 241-AW-102, in the event of equipment failure. The process condensate tank, TK-C-100, is designed to overflow to feed tank 241-AW-102. This mitigates failure of the process condensate pump used to transfer the process condensate to LERF.

Response to equipment and power failures are discussed in more detail in Chapter 7.0, Contingency Plan.

6.4.5 Personnel Exposure

Facility design, administrative controls, and personal protective equipment are used at the 242-A Evaporator to prevent undue exposure of personnel to mixed waste and other hazardous materials. The following features were incorporated into the 242-A Evaporator design to minimize personnel exposure.

- The facility is designed for remote operation of equipment containing highly radioactive solutions such as waste feed and slurry. These solutions usually are present only in the pump room and evaporator room, which are heavily shielded and routinely are not entered by operating personnel.
- The 242-A Building ventilation system is designed to provide air flow from uncontaminated zones to progressively more contaminated zones.
- Emergency lighting devices are located strategically throughout the 242-A Building.
- Eyewash stations and safety showers are located in rooms containing mixed waste or other hazardous materials that personnel routinely enter. For location of these, refer to Chapter 7.0, Contingency Plan.
- Continuous air monitors with audio and/or visual alarms to notify personnel of airborne radioactive contamination are provided in rooms that contain mixed waste and that routinely are entered.
- Methods for decontaminating vessels and equipment are available to reduce personnel exposure if entry for maintenance activity is required.

- Offices, control room, change rooms, and lunchroom are situated to minimize casual exposure of personnel.

All operations are conducted so employee exposure to mixed waste and other hazardous materials are maintained ALARA. Exposures are minimized by engineering or administrative controls with protective gear used where such controls are not practical. Before the start of any operation that might expose personnel to the risk of injury or contamination, a review of the operation is performed to ensure the nature of hazards that might be encountered are considered and that appropriate protective gear is selected. Administrative procedures dictate the level of protective clothing worn and depend on the location within the 242-A Building and the nature of the activity being performed. Personnel are trained to wear personal protective equipment in accordance with approved work procedures.

6.5 PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTE

The following sections describe prevention of reaction of ignitable, reactive, and incompatible waste.

6.5.1 Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste

Administrative procedures are designed to prevent the ignition or reaction of waste at the 242-A Evaporator. The precautions include the following.

- Analysis is performed on candidate waste in the DST System to check that there are no exothermic reactions when the waste is heated and that there will be no adverse affects due to mixing the contents of different waste tanks in the feed tank and evaporator vessel (refer to Chapter 3.0, for details on waste analysis).
- Sample analysis of the candidate waste in the DST System includes a surface sample to identify the presence of a separable organic phase that might be ignitable. If a separate organic phase is detected, the waste solution level in the feed tank is maintained above 2.54 meters to prevent transfer of the organic phase to the 242-A Evaporator.
- The condensate tank, C-100, is equipped with instrumentation to detect the presence of a separable organic phase. If a separate organic phase is detected, the tank is allowed to overflow, transferring the organic phase to the feed tank, 241-AW-102.
- The condensate tank, C-100 is overflowed to the DST System following each campaign to prevent the possibility of accumulating immiscible organics in the condensate waste tank.
- The vapor-liquid separator and the condensate tank are drained and flushed before any welding is performed.
- Administrative safety controls have been established to control the use and quantities of combustibles materials, fuels, and gases. Hot work activities such as cutting, welding, and brazing are administratively controlled as part of the industrial safety program.

6.5.2 Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste

Waste received at the 242-A Evaporator is protected from materials or conditions that might cause the waste to ignite or react. Much of the waste handling is done remotely to reduce the risk to operating personnel. For precautions taken to prevent the ignition or reaction of waste, refer to Section 6.5.1.

The constituents in the waste received at the 242-A Evaporator that are ignitable or reactive are not very volatile. Therefore, the evaporation process renders the waste that is evaporated (i.e., the process condensate) neither ignitable nor reactive.

1 **Table 6.1. Visual Inspection Schedule for Tanks, Piping, and Rooms.**

Item	Inspection	Frequency[1]	Responsible organization	Comments
Tank and Piping Inspection				
Condensate tank and piping	Inspect tank and piping for leaks, corrosion, or wear.	Daily	Operations	
Room Inspections				
AMU room	• Inspect tanks and piping for leaks, corrosion, or wear. • Inspect floor for spills or damage. • Inspect for equipment malfunctions. • Inspect for housekeeping/aisle space.	Daily	Operations	
Pump room	• Inspect piping for leaks, corrosion, or wear. • Inspect floor for spills or damage. • Inspect for equipment malfunctions. • Inspect for housekeeping. • Inspect pump room sump for overflow.	Daily	Operations	Use viewing window in AMU room to perform inspection.
Load out and hot equipment storage room	• Inspect piping for leaks, corrosion, or wear. • Inspect sumps and floor for spills or damage. • Inspect for housekeeping/ aisle space.	Daily	Operations	Use viewing window in AMU room to perform inspection.
Loading room	• Inspect for housekeeping/ aisle space.	Daily	Operations	Use viewing window in AMU room to perform inspection.
Condenser room	• Inspect tanks and piping for leaks, corrosion, or wear. • Inspect floors for spills or damage. • Inspect for equipment malfunctions. • Inspect for housekeeping/ aisle space.	Daily	Operations	
IX column [2] room	• Inspect piping for leaks, corrosion, or wear. • Inspect floor for spills or damage.	Daily	Operations	Surveillance is required only when mixed waste is present in the piping.

2

[1] Continuously: an operator must be present in the control room to respond to alarms when processing waste
Daily: at least every 24 hours
Weekly: at least every 7 days
Monthly: at least every 31 days
Biannually: at least every 184 days
Annually: at least every 365 days
[2] IX column was removed in 2003

1 **Table 6.2. Inspection Schedule of Safety, Security, and Emergency Equipment.**

Item	Inspection	Frequency[1]	Responsible organization	Comments
Security				
Building external doors	Verify external doors are closed and locked.	Daily	Operations	Entrances to office areas are allowed to be unlocked.
Posted warning signs	Verify signs are present, legible, and visible at 7.6 meters.	Weekly	Operations	
Outdoor lighting	Verify outdoor lighting is sufficient.	Weekly	Operations	
Communications				
Crash alarm telephone	Verify crash alarm telephone is operable.	Monthly	Operations	
Emergency sirens	Perform functional check to verify operability.	Monthly	Operations	
Radios	Verify radios are operable and batteries are charged.	Monthly	Operations	
Telephones	Verify telephones are operable.	Quarterly	Operations	
Intercom/public address system	Verify systems are working properly.	Quarterly	Operations	
Emergency Equipment				
Safety showers/ eyewash station	Verify safety showers and eyewash station are operable.	Monthly	Operations	
Emergency lanterns	Verify emergency lanterns are operable.	Monthly	Maintenance	
Fire extinguishers	Verify fire extinguishers are in their proper location with no signs of tampering.	Monthly	Operations	
Spill response kit	Verify all equipment is present (from checklist in kit) with no signs of tampering.	Monthly	Operations	
Self-contained breathing apparatus (SCBA)	Verify shelf life of SCBA is current, no signs of tampering.	Monthly	Operations	
Personal protective clothing	Verify sufficient stock of clothing is available.	Weekly	Operations	
Full-face respirators	Verify respirator shelf life are current and sufficient stock is available.	Monthly	Operations	

2

[1] Continuously: an operator must be present in the control room to respond to alarms
Monthly: at least every 31 days.
Daily: at least every 24 hours
Biannually: at least every 184 days
Weekly: at least every 7 days
Annually: at least every 365 days

1 **Table 6.3. Inspection Schedule for Alarm Monitoring.**

Item	Inspection	Frequency[1]	Responsible organization	Comments
Overfill Protection				
Vapor-liquid separator: WFSH-CA11 WFSH-CA12	Monitor for vapor-liquid separator high level.	Continuously	Operations	Surveillance required only when solution is in the vapor-liquid separator.
Leak Detection				
Sampler lines: LDS-SMPL1 LDS-SMPL2	Monitor feed and slurry sampler lines for leaks.	Continuously	Operations	Surveillance required only during feed or slurry sampling.
Pump room sump: WFI-SUMP1	Monitor for leaks in the evaporator room, pump room, load out and hot equipment storage room and loading room. These rooms drain to the pump room sump.	Continuously	Operations	Surveillance required only when waste solution is present in the rooms listed.

2

[1] Continuously: an operator must be present in the control room to respond to alarms.
Monthly: at least every 31 days.
Daily: at least every 24 hours.
Biannually: at least every 184 days.
Weekly: at least every 7 days.
Annually: at least every 365 days.

1 **Table 6.4. Inspection Schedule for Maintenance and Other Inspections.**

Item	Inspection	Frequency[1]	Responsible organization	Comments
Instrumentation Functional Checks and Calibrations				
Leak detectors	Perform leak detector functional checks.	Refer to comment	Maintenance/ Operations	Perform functional checks within 92 days of campaign startup and every 92 days thereafter until the campaign is over.
Vapor-liquid separator high level alarms: WFSH-CA11 WFSH-CA12	Perform calibrations of loop instruments.	Annually	Maintenance	
Pump room sump level: WFI-SUMP1	Perform calibrations of loop instruments.	Annually	Maintenance	
Emergency Electrical Equipment				
Diesel generator	Verify operability.	Monthly	Maintenance	
Uninterruptible power supply	Verify output voltage and inspect battery for signs of damage or tampering.	Annually	Maintenance	
Fire Systems				
Smoke detectors	Verify operability	Annually	Hanford Fire Department	
Pull stations	Verify operability	Annually	Hanford Fire Department	
Fire extinguishers	Verify that pressure is within proper range and verify unimpaired physical condition.	Annually	Hanford Fire Department	Refer to Table 6.2 for monthly inspection.
Fire hydrant	Check that hydrant is operational.	Biannually (182 days)	Hanford Fire Department	
Fire inspection	Walk down to check for fire extinguishers, access control, labeling, fire lanes, fire hydrants, etc.	Annually	Hanford Fire Department	Hanford Fire Department Checklist is used for the inspection.
Other Inspections				
Integrity assessment	Check integrity of vapor-liquid separator and condensate tank per IAR.	Refer to comment	Operations	Based on the 1998 IA report frequencies for integrity testing is every 10 years, unless otherwise required for system repairs and upgrades.
Integrity assessment	Check integrity of Process Condensate transfer line (PC-5000)	Refer to comment	Operations	The next IA will be performed in 2008 with a frequency for integrity testing every 10 (calendar) years, unless otherwise required by an IQRPE or as required for system repairs and upgrades. All integrity assessments will be conducted in accordance with WAC 173-303-640.

2

[1] Continuously: an operator must be present in the control room to respond to alarms.
Monthly: at least every 31 days
Daily: at least every 24 hours
Biannually: at least every 184 days
Weekly: at least every 7 days
Annually: at least every 365 days

IAR = initial integrity assessment
NACE = National Association of Corrosion Engineers

Hanford Facility RCRA Permit Modification Notification Forms

Part III, Operating Unit 10
Waste Treatment and Immobilization Plant (WTP)

PCNs for quarter ending December 31, 2009:

PCN Number	Modification Form Approval Date	Facility
24590-LAB-PCN-ENV-08-001	12-3-09	LAB
24590-LAW-PCN-ENV-07-008	12-10-09	LAW
24590-LAW-PCN-ENV-07-011	12-10-09	LAW
24590-LAW-PCN-ENV-08-002	10-29-09	LAW
24590-LAW-PCN-ENV-08-003	10-30-09	LAW
24590-PTF-PCN-ENV-08-024	11-24-09	PTF
24590-PTF-PCN-ENV-09-003	10-16-09	PTF
24590-PTF-PCN-ENV-09-006	11-24-09	PTF
24590-PTF-PCN-ENV-09-009	11-6-09	PTF
24590-PTF-PCN-ENV-09-010	11-20-09	PTF
24590-WTP-PCN-ENV-09-001	10-1-09	WTP

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Quarter Ending 12/31/2009 24590-LAB-PCN-ENV-08-001

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 3: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant
Update the Structural Integrity Assessment for the ancillary equipment associated with the WTP Analytical Laboratory (LAB) - Radioactive Liquid Waste Disposal (RLD) System in Appendix 11.11 of the Dangerous Waste Permit.

Submitted by Co-Operator:

BTAllen for D Busche 9/24/09

D. M. Busche Date

Reviewed by ORP Program Office:

10/19/09

G. A. Girard Date

Quarter Ending 12/31/2009 24590-LAB-PCN-ENV-08-001

Hanford Facility RCRA Permit Modification Notification Form	
Unit: **Waste Treatment and Immobilization Plant**	Permit Part: **Part III, Operating Unit 10**

Description of Modification:

The purpose of this Class 1 prime modification is to update the Structural Integrity Assessment for ancillary equipment located in various LAB facility rooms at below grade elevations associated with the LAB Radioactive Liquid Waste Disposal (RLD) System. The following document is submitted to replace the document currently in Appendix 11.11.

Appendix 11.11			
Replace:	24590-CM-HC4-HXYG-00138-02-00016, Rev. 00A	With:	CCN 200253, AREVA-IA-3001891-001

This modification requests Ecology approval and incorporation into the permit the above mentioned integrity assessment report. The report has been updated by the Independent Qualified Registered Professional Engineer (IQRPE). The report reflects the IQRPE's review of numerous final design documents. Examples of design documents reviewed include:

- General Arrangement Plan Drawings, Piping and Instrumentation Diagrams, Mechanical Data Sheets, Facility and Vendor Fabrication Drawings, Specifications, Calculations, and Material Requisitions produced in accordance with References:
    - 24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria";
    - ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers, 1996;
    - ASME Boiler and Pressure Vessel (B&PV) Code, Section III, Division 1, Rules for Construction of Nuclear Facility Components, Subsection NC, and Appendix F, American Society of Mechanical Engineers, 1995;
    - ASME Boiler and Pressure Vessel Code, Section III, Division I, Subsection NF, Appendix N and F, Rules for Construction of Nuclear Power Plant Components (2001);
    - Uniform Building Code (UBC), 1997 Edition, International Conference of Building Officials;
    - 24590-WTP-PER-M-02-002, Rev. 2, Materials for Ancillary Equipment;
    - 24590-WTP-GPG-ENG-004, Rev. 2A, Design Guide Pipe Stress, Pipe Layout, and Support Spacing;
    - 24590-WTP-SE-ENS-03-704, Rev. 0, Safety Evaluation;
    - 24590-WTP-VV-PS-01-001, Rev. 6, Verification and Validation Test Plan/Test Report for ME101, Linear Elastic Analysis of Piping;
    - 24590-WTP-DC-PS-01-002, Rev. 4, Pipe Support Design Criteria;
    - 24590-WTP-PER-PS-02-001, Rev. 4, Ancillary Equipment Pipe Support Design;
    - 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria.

For each item of "Information Assessed" in the integrity assessment report, the items listed under the "Source of Information" column were reviewed and found to furnish adequate design controls and requirements to ensure the design fully satisfies the requirements of Washington Administrative Code, WAC-173-303-640, *Dangerous Waste Regulations*.

Quarter Ending 12/31/2009 24590-LAB-PCN-ENV-08-001

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number:

Enter wording of WAC 173-303-830, Appendix I Modification citation:

In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class [1]1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Modification Approved/Concur: [X] Yes [ ] Denied (state reason below)

Reason for denial:

Reviewed by Ecology:

for 12-03-09

Kelly Elsethagen Date

ISSUED BY
RPP-WTP PDC

R11107793

AREVA

CCN 200253

AFS-09-0298

September 11, 2009

Ms. Jennifer Broadbent
Subcontract Administrator
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Dear Ms. Broadbent:

BECHTEL NATIONAL, INC. CONTRACT NO. 24590-CM-HC4-HXYG-00211
IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAB
RLD ANCILLARY EQUIPMENT (IA-3001891-001) Supersedes CCN # 200245

The structural integrity assessment of the subject ancillary equipment has been completed per the contract requirements and is enclosed for your use. The assessment found that the design is sufficient to ensure that the ancillary equipment is adequately designed and has sufficient structural strength, compatibility with the waste(s) to be processed/stored/treated, and corrosion protection to ensure that it will not collapse, rupture, or fail.

If you have any questions, please contact Tarlok Hundal at (509) 371-1975, or via email at tarlok.hundal@areva.com.

Sincerely,

Fred R. Renz
Contract Management
AREVA Federal Services LLC
Richland Office

llm

Enclosure (1)

cc: D. C. Pfluger, MS 5-L w/enclosure (2)

AREVA Federal Services LLC
2101 Horn Rapids Road, RC-19, Richland, WA 99354, P O Box 840, Richland, WA 99352
Tel : 509 375 8096 - Fax: 509 375 8495 - www.areva.com

IA-3001891-001

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAB RLD ANCILLARY EQUIPMENT

Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

IA-3001891-001

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT
FOR
LAB RLD ANCILLARY EQUIPMENT

"I, Tarlok Hundal have reviewed, and certified a portion of the design of a new tank system or component located at the Hanford Waste Treatment Plant, owned/operated by Department of Energy, Office of River Protection, Richland, Washington. My duties were independent review of the current design for the LAB Radioactive Liquid Waste Disposal (RLD) System Ancillary Equipment, as required by the Washington Administrative Code, *Dangerous Waste Regulations*, Section WAC-173-303-640(3) (a) through (g) applicable components."

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

The documentation reviewed indicates that the design fully satisfies the requirements of the WAC.

The attached review is fifteen (15) pages numbered one (1) through fifteen (15).

Signature

Date 9/11/09

Scope	Scope of this Integrity Assessment	This report consists of the Integrity Assessment for the Dangerous Waste Permit (DWP) effecting ancillary equipment associated with the LAB RLD system components to be located in various LAB facility rooms at below grade elevation, as shown in the General Arrangement drawing 24590-LAB-P1-60-00007. The DWP affecting ancillary equipment for the RLD system is shown in the P&ID drawings listed here and under References below. The ancillary equipment assessed is associated with the following plant items and/or components: 1. Ancillary equipment associated with the Hot Cell Drain Collection Vessel (RLD-VSL-00165) as shown on Drawing No. 24590-LAB-M6-RLD-00001; 2. Ancillary equipment associated with the LAB Area Sink Drain Collection Vessel (RLD-VSL-00164) as shown on Drawing No. 24590-LAB-M6-RLD-00002; 3. Ancillary equipment that comprises the LAB RLD Disposal System C3 Rad Lab Collection Header system as shown on Drawing No. 24590-LAB-M6-RLD-00006; 4. Ancillary equipment associated with the LAB RLD Disposal System – C3 Collection & Leak Detection functions as shown on Drawing No. 24590-LAB-M6-RLD-00007; 5. Ancillary equipment associated with the LAB RLD Disposal System – C5 Collection & Leak Detection functions as shown on Drawing No. 24590-LAB-M6-RLD-00008. <u>Note:</u> Direct buried outside underground double-wall transfer lines shown on the above drawings are outside the scope of this integrity assessment. Their integrity assessment is included in a separate report.
Summary of Assessment		For each item of "Information Assessed" (i.e., Criteria) on the following pages, the items listed under "Source of Information" were reviewed and found to furnish adequate design requirements and controls to ensure that the design fully satisfies the requirements of Washington Administrative Code (WAC), Chapter 173-303 WAC, *Dangerous Waste Regulations*, WAC-173-303-640, *Tank Systems*.

References	Material Requisition, Specifications, Mechanical System Data Sheet, System Description, and Drawings	Material Requisition (MR): 24590-CM-MRA-MPC0-00005, Rev. 2, Pumps, Centrifugal Sealless (MS072)(N012) Specifications: The following Specifications with their respective revision and Specification Change Notices (SCNs) are identified in the above listed Material Requisition document: 24590-WTP-3PS-MPC0-T0002, Engineering Specification for General Centrifugal Pumps to Meet Requirements of ASME B37.1M-2001 and ASME B73.2M-2003 for Commercial (CM) Components; 24590-WTP-3PS-MUMI-T0002, Engineering Specification for Low Voltage Induction Motors; 24590-WTP-3PS-G000-T0001, General Specification for Supplier Quality Assurance Program Requirements; 24590-WTP-3PS-FB01-T0001, Engineering Specification for Structural Design Loads for Seismic Category III/IV Equipment and Tanks; 24590-WTP-3PS-G000-T0002, Engineering Specification for Positive Material Identification (PMI) for Shop Fabrication. Mechanical System Data Sheet: 24590-LAB-MPD-RLD-00001, Rev. 1, ASME/ANSI General Cenrtifugal Pump (Hotcell Drain Collection Vessel Pump, LAB-RLD-PMP-00183A/B). System Description: 24590-LAB-3YD-RLD-00001, Rev. 3, System Description for the Analytical Laboratory Radioactive Liquid Waste Disposal System. Vendor Drawing (Bechtel Code 1 Drawing*): 24590-CM-POA-MPC0-00005-03-00002, Rev. 00B, SPGS Pump Range. * Code 1 Drawing means vendor drawing approved by Bechtel. Plant Drawings including associated (DCNs): 24590-LAB-P1-60-00007, Rev. 2, Analytical Laboratory General Arrangement Plan at El. (-) 19'-2" Sections E-E, F-F & G-G; 24590-LAB-P1-60-00010, Rev. 2, Analytical Laboratory General Arrangement Sections A-A, B-B, C-C, and D-D; 24590-LAB-M5-V17T-00029, Rev. 3, WTP Analytical Laboratory Process Flow Diagram Radioactive Liquid Disposal; 24590-LAB-M6-RLD-00001, Rev. 1, P&ID – LAB Radioactive Liquid Waste Disposal System C5 Collection and Transfer (DCN 00054); 24590-LAB-M6-RLD-00002, Rev. 1, P&ID – LAB Radioactive Liquid Waste Disposal System C3 Collection and Transfer; 24590-LAB-M6-RLD-00006, Rev. 2, P&ID – LAB Radioactive Liquid Waste Disposal System C3 Rad Lab Collection; 24590-LAB-M6-RLD-00007, Rev. 1, P&ID – LAB Radioactive Liquid Waste Disposal System C3 Collection & Leak Detection; 24590-LAB-M6-RLD-00008, Rev. 1, P&ID – LAB Radioactive Liquid Waste Disposal System C5 Collection & Leak Detection (DCN 00054).

Reference (cont'd)	Drawings	24590-LAB-P3-RLD-ZN03413001, Rev. 1, LAB Facility Isometric (Line No. RLD-ZN-03413-N11E-4); 24590-LAB-P3-RLD-ZN00001011, Rev. 1, LAB Facility Isometric (Line No. RLD-ZN-00001-W11B-4); 24590-LAB-P3-RLD-ZN00001012, Rev. 4, LAB Facility Isometric (Line No. RLD-ZN-00001-W11B-4); 24590-LAB-P3-RLD-ZN02205001, Rev. 5, LAB Facility Isometric (Line No. RLD-ZN-02205-S11E-3); 24590-LAB-P3-RLD-ZN03393001, Rev. 0, LAB Facility Isometric (Line No. RLD-ZN-03393-S11E-4); 24590-LAB-P3-RLD-WU22122001, Rev. 1, LAB Facility Isometric (Line No. RLD-WU-22122-S11E-6); 24590-LAB-P3-RLD-WU02198001, Rev. 3, LAB Facility Isometric (Line No. RLD-WU-02198-W11B-3); 24590-LAB-P3-RLD-WU02198002, Rev. 1, LAB Facility Isometric (Line No. RLD-WU-02198-W11B-3); 24590-LAB-P3-RLD-WU02198051, Rev. 1, LAB Facility Isometric (Line No. RLD-WU-02198-W11B-6); 24590-LAB-P3-RLD-WU02198052, Rev. 1, LAB Facility Isometric (Line No. RLD-WU-02198-W11B-6); 24590-LAB-P3-RLD-WU02198053, Rev. 1, LAB Facility Isometric (Line No. RLD-WU-02198-W11B-6); 24590-LAB-P3-RLD-WU02269001, Rev. 2, LAB Facility Isometric (Line No. RLD-WU-02269-W11B-2); 24590-LAB-P3-RLD-WU02269051, Rev. 1, LAB Facility Isometric (Line No. RLD-WU-02269-W11B-4); 24590-LAB-P3-RLD-WU02270001, Rev. 2, LAB Facility Isometric (Line No. RLD-WU-02270-W11B-3); 24590-LAB-P3-RLD-WU02270051, Rev. 0, LAB Facility Isometric (Line No. RLD-WU-02270-W11B-6); 24590-LAB-P3-RLD-WU02279051, Rev. 0, LAB Facility Isometric (Line No. RLD-WU-02279-W11B-6); 24590-LAB-P3-RLD-WU02224051, Rev. 0, LAB Facility Isometric (Line No. RLD-WU-02224-S32B-6); 24590-LAB-P3-RLD-WU02249001, Rev. 1, LAB Facility Isometric (Line No. RLD-WU-02229-S11E-1); 24590-LAB-P3-RLD-ZN03433001, Rev. 1, LAB Facility Isometric (Line No. RLD-ZN-03433-S32B-3); 24590-LAB-P3-RLD-ZN03433002, Rev. 2, LAB Facility Isometric (Line No. RLD-ZN-03433-S32B-3); 24590-LAB-P3-RLD-ZN03433005, Rev. 1, LAB Facility Isometric (Line No. RLD-ZN-03433-S32B-3); 24590-LAB-P3-RLD-ZN03433051, Rev. 1, LAB Facility Isometric (Line No. RLD-ZN-03433-S32B-6); 24590-LAB-P3-RLD-ZN03433056, Rev. 3, LAB Facility Isometric (Line No. RLD-ZN-03433-S32B-8); 24590-LAB-P3-RLD-ZN03433059, Rev. 1, LAB Facility Isometric (Line No. RLD-ZN-03433-S32B-4); 24590-LAB-P3-RLD-ZN03449002, Rev. 0, LAB Facility Isometric (Line No. RLD-ZN-03449-S32B-2); 24590-LAB-P3-RLD-ZN03449052, Rev. 0, LAB Facility Isometric (Line No. RLD-ZN-03449-S32B-4); 24590-LAB-P3-RLD-WU02213001, Rev. 0, LAB Facility Isometric (Line No. RLD-WU-02213-S11E-8); 24590-LAB-PH-P33T-00001, Rev. 1, Pipe Support and Fabrication Details; 24590-LAB-PH-P33T-00002, Rev. 1, Pipe Support and Fabrication Details; 24590-LAB-PH-P33T-00003, Rev. 1, Pipe Support and Fabrication Details; 24590-WTP-PH-50-00003001, Rev. 4, Standard Pipe Support Details, Cantilever-Cantilever CC; 24590-WTP-PH-50-00012001, Rev. 6, Standard Pipe Support Details, Guide-U Bolts GU; 24590-WTP-PH-50-00012002, Rev. 5, Standard Pipe Support Details, Guide-U Strap GU; 24590-WTP-PH-50-00024001, Rev. 2, Standard Pipe Support Details, Strut-Sway WS; 24590-LAB-RLD-H00098, Rev. 2, Pipe Support Drawing; 24590-LAB-RLD-H00394, Rev. 1, Pipe Support Drawing.

	Information Assessed	Source of Information	Assessment
Design	Ancillary equipment design standards are appropriate and adequate for the equipment's intended use.	Drawings and System Description listed above under References; 24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria"; ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers, 1996; 24590-WTP-3DP-G04T-00905, Rev. 10, Determination of Quality Levels.	The Pipe Stress Design Criteria document identifies ASME B31.3 Code as the design code for piping systems of the WTP The P&ID drawings and the System Description document indicate that ancillary equipment associated with the C3/C5 collection, transfer and leak detection functions is Quality Level CM (Commercial Grade) and Seismic Category (SC-III/IV), for personnel protection from hazardous materials. These seismic categories are discussed in detail in the Pipe Stress Design Criteria document. Determination of Quality Levels document and Pipe Stress Design Criteria document provide detailed discussion of quality grades and seismic categories, respectively. The codes, standards, and documents identified and used above are acceptable and adequate for the design of the LAB RLD system ancillary equipment's intended service.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	If the ancillary equipment to be used is not built to a design standard, the design calculations demonstrate sound engineering principles of construction.	Drawings listed above under References; 24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria"; ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers, 1996; 24590-WTP-VV-PS-01-001, Rev. 6, Verification and Validation Test Plan/Test Report for ME101, Linear Elastic Analysis of Piping; 24590-LAB-M6C-RLD-00001, Rev. B, (including ECCN # 00004) LAB RLD Pump and Line Sizing (Calculations); 24590-LAB-P6C-RLD-00004, Rev. A, Richland RPP-WTP. Non-Rad Liquid Waste System (Pipe Stress Analysis); 24590-LAB-P6C-RLD-00006, Rev. C, Pipe Stress Analysis for LAB RLD System; 24590-LAB-P6C-RLD-00041, Rev. C, Pipe Stress Analysis for LAB RLD System; 24590-LAB-P6C-RLD-00045, Rev. B, Richland RPP-WTP LAB Plant RLD System (Pipe Stress Analysis); 24590-LAB-P6C-RLD-00046, Rev. B, Richland RPP-WTP LAB Plant RLD System (Pipe Stress Analysis); 24590-LAB-P6C-RLD-00060, Rev. A, Richland RPP-WTP. Non-Rad Liquid Waste System (Pipe Stress Analysis); 24590-WTP-PHC-P50-00001, Rev. 1, RPP/WTP Support Standards (Calculations); 24590-WTP-3DP-G04T-00906, Rev. 7A, Isometric Drawings and Associated Calculations; 24590-WTP-3DP-G04B-00037, Rev. 15A, Engineering Calculations; 24590-WTP-3PS-PH01-T0002, Rev. 4, Installation of Pipe Supports.	The ancillary equipment is to be built to the design standards. The Pipe Stress Design Criteria specifies that piping is to be designed in accordance with ASME B31.3 Code. The review of the sample isometric and pipe support drawings listed in the References, Pipe Stress Analysis, Pipe Support Calculations, Engineering Specification, Pump and Line Sizing calculations, and of the design process and controls described in Isometric Drawings and Associated Calculations, Engineering Calculations, and Installation of Pipe Supports documents provides adequate assurance that RLD ancillary equipment are properly designed and will be installed and verified to meet the requirements of the applicable design criteria established for the project. The review of the aforementioned documents also demonstrates that sound design engineering principles are used for the design and construction of the ancillary equipment.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	Ancillary equipment has adequate strength at the end of its design life to withstand the operating pressure, operating temperature, thermal expansion, and seismic loads. Equipment is protected against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.	Drawings and System Description listed above under References; 24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria"; ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers, 1996; ASME Boiler and Pressure Vessel (B&PV) Code, Section III, Division 1, Rules for Construction of Nuclear Facility Components, Subsection NC, and Appendix F, American Society of Mechanical Engineers, 1995; Uniform Building Code (UBC), 1997 Edition, International Conference of Building Officials; 24590-WTP-PER-M-02-002, Rev. 2, Materials for Ancillary Equipment; 24590-WTP-GPG-ENG-004, Rev. 2A, Design Guide Pipe Stress, Pipe Layout, and Support Spacing; 24590-WTP-SE-ENS-03-704, Rev. 0, Safety Evaluation for Design (Seismic Design of Piping and Pipe Supports); 24590-WTP-PHC-P50-00001, Rev. 1, RPP/WTP Support Standards (Calculations). 24590-LAB-M6C-RLD-00022, Rev. C, (including ECCN # 00002 and 00006) LAB RLD System Line Pressure and Temperature Conditions (Calculations); 24590-LAB-P6C-RLD-00006, Rev. C, Pipe Stress Analysis for LAB RLD System; 24590-LAB-P6C-RLD-00041, Rev. C, Pipe Stress Analysis for LAB RLD System; 24590-LAB-P6C-RLD-00045, Rev. B, Richland RPP-WTP LAB Plant RLD System (Pipe Stress Analysis); 24590-WTP-DB-ENG-01-001, Rev. 10, Basis of Design; DOE-STD-1020-94, Natural Phenomenon Hazards Design Evaluation Criteria for Department of Energy Facilities (including Change Notice #1, January 1996).	The Pipe Stress Design Criteria document requires the use of the ASME B31.3 Code and DOE-STD-1020-94 standard document for piping design. ASME B31.3 Code requires explicit consideration of operating pressure, operating temperature, thermal expansion/contraction, settlement, vibration, and corrosion allowance in the design of piping. Elements of the ASME B&PV Code, Section III, Division 1, Subsection NC and Appendix F, and the Uniform Building Code (UBC) are used to supplement the requirements of ASME B31.3 Code and DOE-STD-1020-94 for the design of Seismic Category (SC-III/SC-IV) piping. Details of the seismic design methods are discussed in the Pipe Stress Design Criteria and Safety Evaluation documents. The Basis of Design document specifies that mechanical equipment is to be designed for a nominal plant life of 40 years. Components in non-maintainable areas are to be designed to last the entire design life of the plant. The Materials for Ancillary Equipment document specifies that ancillary equipment downstream of a waste source vessel is to be constructed of the same or better material and with the same corrosion allowance as the source vessel, unless the service seen in the downstream line warrants a different material, corrosion allowance, or other modification. Using the same or better materials and corrosion allowance for downstream ancillary equipment ensures that the equipment will be able to withstand all anticipated loadings for the entire design service life. The above mentioned codes and standards including the Design Guide document, ensure that the ancillary equipment has adequate strength at the end of its design life to withstand all anticipated loads. Review of sample ancillary equipment calculations and drawings indicates that they are adequately designed meeting the requirements of the aforementioned applicable code and standards.

	Information Assessed	Source of Information	Assessment
Supports	Ancillary equipment supports are adequately designed.	Drawings listed above under References; 24590-WTP-DC-PS-01-002, Rev. 4, Pipe Support Design Criteria; 24590-WTP-PER-PS-02-001, Rev. 4, Ancillary Equipment Pipe Support Design; ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers (1996); ASME Boiler and Pressure Vessel Code, Section III, Division I, Subsection NF, Appendix N and F, Rules for Construction of Nuclear Power Plant Components (2001); 24590-WTP-PL-PS-01-001, Rev. 2, Verification and Validation Test Plan for Bechtel's ME150 Pipe Support Family of Programs (PCFAPPS); 24590-LAB-PHC-RLD-00003, Rev. B, RPP-WTP Engineered Support Calculation for LAB-RLD-H00098 and LAB-RLD-H00079); 24590-LAB-PHC-RLD-00101, Rev. A, RPP-WTP Engineered Support Calculation for LAB-RLD-H00394); 24590-LAB-PHC-P33T-00001, Rev. A, Pipe Support Calculation; 24590-LAB-SSC-S15T-00013, Rev. 0 (including ECCN # 00006), Leak Detection Box Support Design, (Calculations); 24590-WTP-PHC-P50-00001, Rev. 1, RPP/WTP Support Standards (Calculations).	The Pipe Support Design Criteria document considers all loadings identified in ASME B31.3 Code and utilizes ASME Section III, Division 1, Subsection NF and Appendix F to supplement the requirements of ASME B31.3 Code for seismic design of Seismic Category (SC-III/IV) pipe supports. Loads are evaluated against the design criteria provided in ASME Section III, Division 1, as discussed in the Pipe Support Design Criteria document. Bounding load cases are passed to the pipe support designers from the results of the ancillary equipment piping stress analyses. Analysis is by manual calculation or approved computer programs that have been verified and validated as discussed in the Verification and Validation Test Plan. These are appropriate codes and standards that assure adequate design of ancillary equipment supports for the LAB RLD system. Design standards for vessel internal equipment supports are discussed in the integrity assessment for the RLD system vessels. Review of the sample calculation documents shows that the ancillary equipment supports are adequately designed to meet the requirements of the aforementioned coded and standards.

	Information Assessed	Source of Information	Assessment
Connections	Seams and connections are adequately designed.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 10, Basis of Design; 24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria Including "Pipe Stress Criteria" and "Span Method Criteria"; ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers (1996); ASME Boiler and Pressure Vessel (B&PV) Code, Section IX, Welding and Brazing Qualifications; ASME B16.5 Code, Piping Flanges and Flanged Fittings, (1988); 24590-LAB-P6C-RLD-00006, Rev. C, Richland Pipe Stress Analysis for LAB RLD System; 24590-LAB-P6C-RLD-00041, Rev. C, Richland Pipe Stress Analysis for LAB RLD System; 24590-LAB-P6C-RLD-00046, Rev. B, Richland RPP-WTP LAB Plant RLD System (Pipe Stress Analysis).	The Basis of Design specifies that in-cell piping that is non-maintainable will be fully welded. The Pipe Stress Design Criteria specifies the ASME B31.3 Code as the design code for the piping systems. Welding is to be performed in accordance with the requirements of ASME B31.3 Code and the ASME B&PV Code, Section IX. ASME B16.5 Code is specified for pipe flanges and equipment flanges where flanges are used for connections. The aforementioned documents provide appropriate requirements and guidelines to adequately design the seams and connections to sustain the applicable loads. Review of sample ancillary equipment calculations and drawings indicates that they are adequately designed meeting the requirements of the aforementioned applicable code and standards.
Foundation	The system will withstand the effects of frost heave.	Drawings listed above under References; 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria.	The RLD system ancillary equipment considered in this assessment as shown on the drawings is located in several vessel cells and associated pump and piping pits, and in the building concrete surrounded by the R2/C2 laboratory operations areas, and radiological maintenance and waste handling areas inside the LAB Facility. The Structural Design Criteria requires that all structural foundations shall extend into the surrounding soil below the frost line in order to preclude frost heave. The frost line is 30 in. below grade and the RLD system ancillary equipment is inside the building, therefore, is not subject to the effects of frost heave.

	Information Assessed	Source of Information	Assessment
Waste Characteristics	Characteristics of the waste to be stored or treated have been identified (ignitable, reactive, toxic, specific gravity, vapor pressure, flash point, temperature)	Drawings and System Description listed above under References. 24590-WTP-PER-PR-03-001, Rev. 1, Prevention of Hydrogen Accumulation in WTP Tank Systems and Miscellaneous Treatment Unit Systems; 24590-WTP-PER-PR-03-002, Rev. 3, Control of Toxic Vapors and Emissions from WTP Tank and Miscellaneous Treatment Unit Systems.	The System Description identifies that the RLD system vessels provide for receipt and temporary storage of secondary wastes from the Laboratory operations. The System Description identifies that secondary containment for the C5 vessel cell is the only important-to-safety function in the Laboratory Facility. Administrative controls are placed on the radiological inventory in the C5 vessel and addition of organic chemicals to the C5 tank. Therefore the C5 vessel does not represent a hydrogen or chemical flammability hazard. The System Description states that during normal LAB operations, numerous small samples are taken for analysis purposes. Therefore, the quantities of hazardous material being handled by LAB ancillary equipment are typically small, not continuous in time, diluted with water, and flushed back into the system. Various waste characteristics are also discussed in the Control of Toxic Vapors and Emissions and Prevention of Hydrogen Accumulation documents which describe that the LAB RLD system process does not pose any safety or health concerns.

	Information Assessed	Source of Information	Assessment
Waste Characteristics (cont'd)	Ancillary equipment is designed to handle the wastes with the characteristics defined above and any treatment reagents.	Drawings and System Description listed above under References; 24590-WTP-PER-PL-02-001, Rev. 6, Piping Material Class Description; 24590-WTP-PER-M-02-002, Rev. 2, Materials for Ancillary Equipment.	The RLD system drain manifolds are doubly contained piping to provide for secondary containment of dangerous waste. The System Description document states that during normal operations, samples from the laboratory operations will be neutralized with water and flushed to the RLD system. However, the drain manifolds that are likely to receive any reagents by accident are equipped with the primary piping material UNS N06022 (Hastelloy C-22), a material normally used for highly corrosive service (Pipe Class W11B). Drain manifolds that see less severe service use 316L stainless steel for the primary lines (Pipe Class S32B). The secondary containment lines are typically carbon steel. The line identification numbers on the P&ID drawings include the piping material class for each line. The materials for these classes are tabulated in the Piping Material Class Description document. For ancillary equipment downstream from a vessel, the Materials for Ancillary Equipment document specifies that its material should be same or better as of the waste source vessel and with the same corrosion allowance as the source vessel, unless the service seen in the downstream line warrants a different material, corrosion allowance, or other modification. Bounding corrosion/erosion allowances are listed in the Piping Material Class Description document for each piping material class. The aforementioned information ensures that the ancillary equipment is adequately designed to manage the waste and reagents associated with the LAB RLD system

	Information Assessed	Source of Information	Assessment
Compatibility	The pH range of the waste, waste temperature and the corrosion behavior of the structural materials are adequately addressed. Ancillary equipment material and protective coatings ensure the ancillary equipment structure is adequately protected from the corrosive effects of the waste stream and external environments. The protection is sufficient to ensure the equipment will not leak or fail for the design life of the system.	Drawings and System Description listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1O, Basis of Design; 24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection.	The Basis of Design document identifies a service design life of 40 years for the ancillary equipment. All non-maintainable items will be designed to last the life of the facility. The System Description document identifies that the waste to be handled in this ancillary equipment as non-organic liquid process waste. It also states that during normal operations samples from the laboratory operations will be neutralized with water and flushed to the RLD system. However, the drain manifolds that are likely to receive reagents by accident are equipped with the primary piping material UNS N06022 (Hastelloy C-22), a material normally used for highly corrosive service. Drain manifolds that see less severe service use 316L stainless steel for the primary lines. As noted on the P&ID drawings, the exterior surface material of the double-wall pipe that penetrate the RLD vessel cells is to be same as the cell secondary containment liner material. Material Selection document lists appropriate materials to be used for the secondary containment liner in the cell. Therefore, the ancillary equipment will provide the expected design service life.

	Information Assessed	Source of Information	Assessment
Corrosion Allowance	Corrosion allowance is adequate for the intended service life of the ancillary equipment.	Drawings listed above under References; 24590-LAB-N1D-RLD-00005, Rev. 0, Corrosion Evaluation, LAB Hotcell Drain Collection Vessel Pump (RLD-PMP-00183A/B); 24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria;" ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers (1996); 24590-WTP-DB-ENG-01-001, Rev. 10, Basis of Design; 24590-WTP-PER-M-02-002, Rev. 2, Materials for Ancillary Equipment; 24590-WTP-PER-PL-02-001, Rev. 6, Piping Material Class Description; 24590-LAB-P6C-RLD-00006, Rev. C, Pipe Stress Analysis for LAB RLD System; 24590-LAB-P6C-RLD-00041, Rev. C, Pipe Stress Analysis for LAB RLD System; 24590-LAB-P6C-RLD-00046, Rev. B, Richland RPP-WTP LAB Plant RLD System (Pipe Stress Analysis).	The Pipe Stress Design Criteria requires use of the ASME B31.3 Code for ancillary equipment design. Consideration of corrosion allowance is a mandatory requirement of ASME B31.3 Code. A required service life of 40 years is identified in the Basis of Design document for ancillary equipment that is not accessible for maintenance. Those drain manifolds that are likely to receive reagents are equipped with the primary piping material UNS N06022 (Hastelloy C-22), a material normally used for highly corrosive service (Pipe Class W11B-double walled piping). Drain manifolds that see less severe service use 316L stainless steel for the primary lines (Pipe Class S32B-double walled piping). The secondary containment lines are typically carbon steel. Single walled drain lines and transfer lines located in the RLD vessel cells, pumps and piping pits, and other secondary containment components are primary are constructed of piping of Classes S11E and S11P which are 316L stainless steel material. Some N11E (UNS N06022-Hasellow C-22) material is also used for single walled drain lines located inside the LAB secondary containment structures. For ancillary equipment downstream from a vessel, the Materials for Ancillary Equipment document specifies that its material should be same or better as of the waste source vessel and with the same corrosion allowance as the source vessel, unless the service seen in the downstream line warrants a different material, corrosion allowance, or other modification. Bounding corrosion/erosion allowances are listed in the Piping Material Class Description document for each piping material class. The Corrosion Evaluation and selection of materials listed in the Piping Material Class Description document and as shown on drawings, for the ancillary equipment is compatible with the operating environment for their required design life. Review of the sample ancillary equipment documents shows that appropriate corrosion allowances have been used.

	Information Assessed	Source of Information	Assessment
Pressure Controls	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the vessels are exceeded.	Drawings listed above under References; 24590-WTP-DC-PS-01-001, Rev.6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria"; ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers, 1996; 24590-WTP-PER-PL-02-001, Rev. 6, Piping Material Class Description.	The Pipe Stress Design Criteria document specifies ASME B31.3 Code as the design code for the WTP piping. Most of the ancillary equipment in the LAB consists of gravity drain manifolds for the laboratory hotcells, gloveboxes, hoods, and maintenance and waste handling areas. ASME B31.3 Code requires provision be made to safely contain or relieve any pressure to which the piping may be subjected. ASME B31.3 Code piping not protected by a pressure relieving device, or that can be isolated from a pressure relieving device must be designed for at least the highest pressure that can be developed. The Piping Material Class Description document lists enveloping pressure and temperature limits for each piping material class. These requirements are appropriate and adequate for the ancillary equipment design.

	Information Assessed	Source of Information	Assessment
Pressure Controls (cont'd)	Maximum flows and any unusual operating stresses are identified	Drawings listed above under References; 24590-WTP-DC-PS-01-001, Rev.6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria"; ASME B31.3 Code, Process Piping, American Society of Mechanical Engineers, 1996; 24590-WTP-PER-PL-02-001, Rev. 6, Piping Material Class Description. 24590-WTP-3PS-P000-T0001, Rev. 6, Engineering Specification for Piping Material Classes General Description and Summary; 24590-WTP-3DP-G04T-00906, Rev. 7A, Isometric Drawings and Associated Calculations; 24590-WTP-3DP-G04B-00037, Rev. 15A, Engineering Calculations.	The expected flow paths for the ancillary equipment are identified on the P&ID drawings. The Pipe Stress Design Criteria specifies the ASME B31.3 Code for piping design. This code requires piping to be designed to the highest pressure that can be developed in a piping system assuring that maximum operating stresses remain within code allowables. Piping material classes are shown on the P&ID drawings, embedded in the item numbers for each ancillary equipment component. Ancillary equipment is designed for the highest anticipated temperature and pressure values which are also within the bounding maximum design temperature and pressure values listed for each piping material class in the Piping Material Class General Description document. ASME B31.3 and the associated standards are appropriate and adequate for the design of the ancillary equipment. Furthermore, the fabrication or isometric drawings released for construction by Bechtel National, Inc. (BNI), and the design process and controls described in the Isometric Drawings and Associated Calculations, and Engineering Calculations documents provides adequate assurance that subject ancillary equipment are properly designed to meet the requirements identified in the applicable design criteria established for the project.

	Information Assessed	Source of Information	Assessment
Secondary Containment	Ancillary equipment is designed with secondary containment that is constructed of materials compatible with the waste and of sufficient strength to prevent failure (pressure gradients, waste, climatic conditions, daily operations), provided with a leak-detection system, and designed to drain and remove liquids.	Drawings listed above under References; 24590-WTP-PER-PL-02-001, Rev. 6, Piping Material Class Description; 24590-WTP-PER-M-02-001, Rev. 3, Material Selections for Building Secondary Containment/Leak Detection.	The ancillary equipment considered in this assessment is located in several vessel cells and associated pump and piping pits, and in the building concrete surrounded by the R2/C2 laboratory operations areas, and radiological maintenance and waste handling areas inside the LAB Facility. Secondary containment for ancillary equipment within the vessel cells and pits is provided by the liners and sumps within the cells and pits which are outside the scope of this integrity assessment. Secondary containment for the various gravity drain manifolds shown on the P&ID drawings is provided by doubly contained piping arrangements. The primary lines are typically corrosion resistant alloys while the secondary containment pipes are carbon steel as shown on the drawings and as described in the Piping Material Class Description document. All of the manifolds slope toward the RLD vessel cells. The carbon steel secondary containments are all provided with low-point leak detection boxes which are physically located in the cells. Drain manifolds are equipped with "clean outs" to facilitate access for unplugging the lines. Flush water connections are provided at the high points of the drain manifolds. These connections also provide for pneumatic testing of the secondary containment lines and leak detection boxes. The ancillary equipment is designed and constructed per the requirements of Material Selections document. The ancillary equipment material is compatible with the waste, has sufficient strength to prevent failure, provided with leak-detection system, and designed to drain and remove liquids.

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Quarter Ending 12/31/2009 24590-LAW-PCN-ENV-07-008

Hanford Facility RCRA Permit Modification Notification Form

Part III, Operating Unit 10

Waste Treatment and Immobilization Plant

Index

Page 2 of 3: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant
Update the integrity assessment report for ancillary equipment associated with WTP LAW Concentrate Receipt Process System (LCP) vessels (LCP-VSL-00001 and LCP-VSL-00002) located in Appendix 9.11 of the WTP Dangerous Waste Permit.

Submitted by Co-Operator:

D M Busche 11/4/09
D. M. Busche Date

Reviewed by ORP Program Office:

G A Girard 18Nov09
G. A. Girard Date

Quarter Ending 12/31/2009 24590-LAW-PCN-ENV-07-008

Hanford Facility RCRA Permit Modification Notification Form	
Unit: **Waste Treatment and Immobilization Plant**	Permit Part: **Part III, Operating Unit 10**

Description of Modification:

The purpose of this Class 1 prime modification is to update the integrity assessment report for ancillary equipment associated with Low Activity Waste (LAW) Concentrate Receipt Process System (LCP) vessels located in the Wet Process Cells (Rooms L-0123 and L-0124) at Elevation 2'-0" and in the Process Cell Change Floor Room L-0202 located directly above the Wet Process Cells at Elevation 28'-0". The following document is submitted to replace the report currently in Appendix 9.11.

Please note that the integrity assessment report being replaced addressed both the LAW LCP and LAW Radioactive Liquid Waste Disposal System (RLD) vessel ancillary equipment; this new report is limited to only LAW LCP vessel ancillary equipment. The integrity assessment report specific to the RLD System vessel ancillary equipment is being transmitted separately under PCN 24590-LAW-PCN-ENV-07-011.

Appendix 9.11			
Replace:	24590-CM-HC4-HXYG-00138-01-14, Rev. 00B	With:	IA-3001932-000 / CCN: 200246

This modification requests Washington State Department of Ecology (Ecology) approve and incorporate into the permit the above mentioned integrity assessment report. The report has been updated by the Independent Qualified Registered Professional Engineer (IQRPE). The report reflects the IQRPE's review of the following final design documents at the time of review:

- Facility and Vendor Fabrication Drawings, Mechanical Data Sheets, Material Selection Data Sheets, System Descriptions, and Design Calculations produced in accordance with References:
  - AISC Manual of Steel Construction, ASD, 9th Edition, American Institute of Steel Construction
  - ASME B16.5, Piping Flanges and Flanged Fittings, American Society of Mechanical Engineers
  - ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers
  - ASME Boiler and Pressure Vessel Code (B&PV), Section IX, Welding and Brazing Qualifications, American Society of Mechanical Engineers
  - ASME Boiler and Pressure Vessel Code, Section III, Division I, Rules for Construction of Nuclear Power Plant Components, American Society of Mechanical Engineers, 1995
  - ASTM Annual Book of ASTM Standards, American Society of Testing and Materials
  - MSS-SP-58, Pipe Hangers and Supports-Materials, Design, and Manufacture, Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.
  - Uniform Building Code (UBC), 1997
- 24590-LAW-P6C-LCP-00001, Rev. C, Pipe Stress Analysis - LAW LCP Systems
- 24590-LAW-P6C-LCP-10001, Rev. C, Pipe Stress Analysis - LAW LCP System
- 24590-LAW-P6C-LCP-10010, Rev. B, Richland RPP-WTP - LAW Plant LCP System (Pipe Stress Analysis)
- 24590-LAW-PER-M-02-001, Rev. 5, LAW Facility Sump Data
- 24590-WTP-3DP-G04B-00037, Rev. 11A, Engineering Calculations
- 24590-WTP-3DP-G04T-00905, Rev. 8, Determination of Quality Levels
- 24590-WTP-3DP-G04T-00906, Rev. 6, Isometric Drawings and Associated Calculations
- 24590-WTP-3PS-NN00-T0001, Rev. 1, Engineering Specification for Thermal Insulation for Mechanical Systems
- 24590-WTP-3PS-P000-T0001, Rev. 5, Engineering Specification for Piping Material Classes General Description and Summary
- 24590-WTP-3PS-PH01-T0002, Rev. 3, Installation of Pipe Supports
- 24590-WTP-DB-ENG-01-001, Rev. 1J, WTP Basis of Design
- 24590-WTP-DC-PS-01-001, Rev. 5, Pipe Stress Design Criteria Including "Pipe Stress Criteria" and "Span Method Criteria"

Quarter Ending 12/31/2009 24590-LAW-PCN-ENV-07-008

- 24590-WTP-DC-PS-01-002, Rev. 4, Pipe Support Design Criteria
- 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria
- 24590-WTP-GPG-ENG-004, Rev. 2A, Design Guide Pipe Stress, Pipe Layout, and Support Spacing
- 24590-WTP-GPG-ENG-005, Rev. 3A, Engineering Design Guide for Pipe Supports
- 24590-WTP-PER-M-02-002, Rev. 1, Materials for Ancillary Equipment
- 24590-WTP-PER-PL-02-001, Rev. 6, Piping Material Class Description
- 24590-WTP-PER-PR-03-001, Rev. 1, Prevention of Hydrogen Accumulation in WTP Tank Systems and Miscellaneous Treatment Units
- 24590-WTP-PER-PR-03-002, Rev. 3, Control of Toxic Vapors and Emissions from WTP Tank and Miscellaneous Unit Systems.
- 24590-WTP-PER-PS-02-001, Rev. 4, Ancillary Equipment Pipe Support Design
- 24590-WTP-PH-50-00012001, Rev. 4, Standard Pipe Support Details Guide - U Bolts GU
- 24590-WTP-PH-50-00012002, Rev. 2, Standard Pipe Support Details Guide - U Strap GU
- 24590-WTP-PHC-P50-00001, Rev. 0, RPP/WTP Support Standards
- 24590-WTP-PHC-P50T-00001, Rev. 1, U-Bolt Load Capacity Calculation
- 24590-WTP-PHC-P50T-00002, Rev. 0, Justification for the Use of Standard Supports for RPP-WTP Project
- 24590-WTP-PHC-P50T-00004, Rev. 0, Qualification of Pipe Straps
- 24590-WTP-PL-PS-01-001, Rev. 1, Verification and Validation Test Plan for Bechtel's ME150 Pipe Support Family of Programs (PCFAPPS)
- 24590-WTP-SE-ENS-03-704, Rev. 0, Seismic Evaluation for Design (Seismic Design of Piping and Pipe Supports)

For each item of "Information Assessed" in the integrity assessment report, the items listed under the "Source of Information" column were reviewed and found to furnish adequate design controls and requirements to ensure the design fully satisfies the requirements of Washington Administrative Code, WAC-173-303-640, *Dangerous Waste Regulations.*

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number:

Enter wording of WAC 173-303-830, Appendix I Modification citation:

In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class [1]1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Modification Approved/Concur: [X] Yes [ ] Denied (state reason below)

Reason for denial:

Reviewed by Ecology:

K. Elsethagen 12-10-2009

Kelly Elsethagen Date

AREVA

R11099099

AFS-09-0284

CCN: 200246

August 13, 2009

Ms. Jennifer Broadbent
Subcontract Administrator
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Dear Ms. Broadbent:

BECHTEL NATIONAL, INC. CONTRACT NO. 24590-CM-HC4-HXYG-00211 IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAW LCP ANCILLARY EQUIPMENT (IA-3001932-000)

The structural integrity assessment of the subject ancillary equipment has been completed per the contract requirements and is enclosed for your use. The assessment found that the design is sufficient to ensure that the ancillary equipment is adequately designed and has sufficient structural strength, compatibility with the waste(s) to be processed/stored/treated, and corrosion protection to ensure that it will not collapse, rupture, or fail.

If you have any questions, please contact Tarlok Hundal at (509) 371-1975, or via email at tarlok.hundal@areva.com.

Sincerely,

Fred R. Renz
Contract Management
AREVA Federal Services LLC
Richland Office

llm

Enclosure (1)

cc: D. C. Pfluger, MS 5-L w/enclosures (2)

AREVA Federal Services LLC
2101 Horn Rapids Road, RC-19, Richland, WA 99354, P. O. Box 840, Richland, WA 99352
Tel.: 509 375 8096 - Fax: 509 375 8495 - www.areva.com

IA-3001932-000

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAW LCP ANCILLARY EQUIPMENT

Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

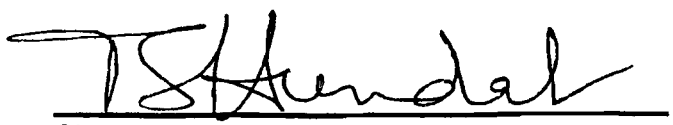
IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAW LCP ANCILLARY EQUIPMENT

"I, Tarlok Hundal have reviewed, and certified a portion of the design of a new tank system or component located at the Hanford Waste Treatment Plant, owned/operated by Department of Energy, Office of River Protection, Richland, Washington. My duties were independent review of the current design for the LAW Concentrate Receipt Process System (LCP) Ancillary Equipment, as required by the Washington Administrative Code, *Dangerous Waste Regulations*, Section WAC-173-303-640(3) (a) through (g) applicable components."

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

The documentation reviewed indicates that the design fully satisfies the requirements of the WAC.

The attached review is twelve (12) pages numbered one (1) through twelve (12).



Signature

8/13/09

Date

Scope	Scope of this Integrity Assessment	This Integrity Assessment addresses ancillary equipment associated with the Low Activity Waste (LAW) Concentrate Receipt Process System (LCP) vessels (LCP-VSL-00001 and LCP-VSL-00002) and other plant items located in the LAW facility. It routes thru various rooms and areas. The ancillary equipment such as pipelines, valves, and other items associated with these vessels are shown on the P&ID drawings (24590-LAW-M6-LCP-00001 and -00002) and also as described in the scope section of the System Description document (24590-LAW-3YD-LCP-00001). This ancillary system is primarily located in the Wet Process Cells (Rooms L-0123 and L-0124) @ Elevation 2'-0" and in the Process Canyon Room L-0202 which is located @ Elevation 28'-0" directly above these Wet Process Cells. Ancillary equipment located inside the LCP system vessels and other plant items are addressed separately in the Integrity Assessment for these vessels and plant items.
Summary of Assessment		For each item of "Information Assessed" (i.e., Criteria) on the following pages, the items listed under "Source of Information" were reviewed and found to furnish adequate design requirements and controls to ensure that the design fully satisfies the requirements of Washington Administrative Code (WAC), Chapter 173-303 WAC, *Dangerous Waste Regulations*, WAC-173-303-640, *Tank Systems*.

Information Assessed		Source of Information	Assessment
Design	Ancillary equipment design standards are appropriate and adequate for the equipment's intended use.	Drawings and System Description listed above under References; 24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria;" ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers; 24590-WTP-3DP-G04T-00905, Rev. 10, Determination of Quality Levels.	The Pipe Stress Design Criteria identifies ASME B31.3 as the design code for piping systems of the WTP. The System Description document classify the LCP system as Risk Reduction Class (RRC) to provide primary containment of radioactive liquids. The Drawings and System Description documents show that the ancillary equipment is of commercial quality level (CM) grade or quality level Q and are Seismic Category SC-III/IV. Determination of Quality Levels document and Pipe Stress Design Criteria document provide detailed discussion of quality grades and seismic categories, respectively. The codes and standards used are acceptable and adequate for the design of the ancillary piping for the intended service.

Information Assessed		Source of Information	Assessment
Design (cont'd)	Ancillary equipment has adequate strength at the end of its design life to withstand the operating pressure, operating temperature, thermal expansion, and seismic loads. Equipment is protected against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.	24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria;" ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers; ASME Boiler and Pressure Vessel Code, Section III, Division 1, Rules for Construction of Nuclear Power Plant Components, American Society of Mechanical Engineers, 1995; Uniform Building Code (UBC), 1997; 24590-WTP-PER-M-02-002, Rev. 2, Materials for Ancillary Equipment; 24590-WTP-GPG-ENG-004, Rev. 2A, Design Guide Pipe Stress, Pipe Layout, and Support Spacing; 24590-WTP-SE-ENS-03-704, Rev. 0, Seismic Evaluation for Design (Seismic Design of Piping and Pipe Supports).	The Pipe Stress Design Criteria requires the use of the ASME B31.3 Code for process piping design. ASME B31.3 requires explicit consideration of operating pressure, operating temperature, thermal expansion/contraction, settlement, vibration, and corrosion allowance in the design of piping. For the seismic design of Seismic Category (SC-III/IV) ancillary equipment, applicable sections of ASME Section III, Division 1, Appendix F, and sections of Uniform Building Code (UBC) are used to supplement the requirements of ASME B31.3. Details of the seismic design methods are discussed in the Pipe Stress Design Criteria and Seismic Evaluation documents. These are appropriate and adequate codes and standards including the Design Guide document, to ensure that the ancillary equipment has adequate strength at the end of its design life to withstand all anticipated loads.

Information Assessed		Source of Information	Assessment
Foundations	The system will withstand the effects of frost heave.	Drawings listed above under References; 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria.	The Structural Design Criteria requires that all outdoor equipment structural foundations shall extend into the surrounding soil below the 30" frost line to preclude frost heave. The LCP ancillary equipment system considered in this assessment is located inside the LAW facility. The LAW facility structural foundations are well below the grade elevation, therefore, the LCP system is not subjected to any frost heave effects.
Connections	Seams and connections are adequately designed.	24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria;" ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers; ASME B16.5, Piping Flanges and Flanged Fittings, American Society of Mechanical Engineers; ASME Boiler and Pressure Vessel Code (B&PV), Section IX, Welding and Brazing Qualifications, American Society of Mechanical Engineers.	The Pipe Stress Design Criteria specifies the ASME B31.3 Process Piping design code for the piping systems. Welding is to be performed in accordance with the requirements of ASME B31.3 and the ASME B&PV Code, Section IX. ASME B16.5 is specified for flange designs. These are appropriate codes and standards for design and fabrication of the LCP System ancillary equipment.

	Information Assessed	Source of Information	Assessment
Compatibility	The pH range of the waste, waste temperature and the corrosion behavior of the structural materials are adequately addressed. Ancillary equipment material and protective coatings ensure the ancillary equipment structure is adequately protected from the corrosive effects of the waste stream and external environments. The protection is sufficient to ensure the equipment will not leak or fail for the design life of the system.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1N, Basis of Design; 24590-WTP-PER-M-02-002, Rev. 2, Materials for Ancillary Equipment; 24590-WTP-PER-PL-02-001, Rev. 6, Piping Material Class Description; 24590-WTP-3PS-NN00-T0001, Rev. 2, Engineering Specification for Thermal Insulation for Mechanical Systems; ASTM Annual Book of ASTM Standards, American Society of Testing and Materials.	The Basis of Design document identifies a service design life of 40 years for the ancillary equipment. Detailed materials selection (corrosion) evaluations are conducted for each vessel in the LAW facility during process design to assure a 40-year service life. The Materials for Ancillary Equipment document requires that the material selection and corrosion/erosion allowances for ancillary equipment in contact with the waste will be equal to or better than the material and corrosion allowance of the waste source vessel. Sample review of the ancillary equipment material specified in the drawings and/or other related documents show that it meets the requirements as described in the Materials for Ancillary Equipment document. The Thermal Insulation specification requires that all insulating materials used on the outside of ancillary equipment be pre-approved for use on austenitic stainless steel in accordance with applicable ASTM standards and tests to preclude external corrosion of ancillary equipment. Therefore, the ancillary equipment is expected to provide the expected design service life.

Information Assessed		Source of Information	Assessment
Pressure Controls (cont'd)	Maximum flows and any unusual operating stresses are identified	Drawings listed above under References; 24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria;" ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers; 24590-WTP-3PS-P000-T0001, Rev. 6, Engineering Specification for Piping Material Classes General Description and Summary; 24590-WTP-PER-PL-02-001, Rev. 6, Piping Material Class Description; 24590-WTP-3DP-G04T-00906, Rev. 7A, Isometric Drawings and Associated Calculations; 24590-WTP-3DP-G04B-00037, Rev. 15A, Engineering Calculations.	The expected flow paths for the ancillary equipment are identified on the P&ID drawings. The Pipe Stress Design Criteria specifies the ASME B31.3 code for piping design. This code requires piping to be designed to the highest pressure that can be developed in a piping system assuring that maximum operating stresses remain within code allowables. Piping material classes are shown on the P&ID drawings, embedded in the item numbers for each ancillary equipment component. Each ancillary equipment is designed for the highest anticipated temperature and pressure values which are also within the bounding maximum design temperature and pressure values listed for each piping material class in the Piping Material Class General Description document. Furthermore, the fabrication of isometric drawings released for construction by Bechtel National, Inc. (BNI), the design process and controls described in the Isometric Drawings and Associated Calculations, and Engineering Calculations documents provides adequate assurance that subject ancillary equipment are properly designed, will be installed and verified to meet the requirements identified in the applicable design criteria established for the project.

Quarter Ending 12/31/2009 24590-LAW-PCN-ENV-07-011

Hanford Facility RCRA Permit Modification Notification Form

Part III, Operating Unit 10

Waste Treatment and Immobilization Plant

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Page 2 of 3: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant
Update the integrity assessment report for ancillary equipment associated with WTP LAW Radioactive Liquid Waste Disposal System (RLD) vessels (RLD-VSL-00004, RLD-VSL-00003, and RLD-VSL-00005) located in Appendix 9.11 of the Dangerous Waste Permit.

Submitted by Co-Operator:

D. M. Busche — 11/4/09 Date

Reviewed by ORP Program Office:

G. A. Girard — 18 NOV 09 Date

Quarter Ending 12/31/2009 24590-LAW-PCN-ENV-07-011

Hanford Facility RCRA Permit Modification Notification Form	
Unit: **Waste Treatment and Immobilization Plant**	Permit Part: **Part III, Operating Unit 10**

Description of Modification:

The purpose of this Class 1 prime modification is to update the integrity assessment report for ancillary equipment associated with Low Activity Waste (LAW) Radioactive Liquid Waste Disposal System (RLD) vessels: RLD-VSL-00004 located in C3/C5 Drain Collection Cell L-B001B at Elevation (-)21'-0"; and RLD-VSL-00003 and RLD-VSL-00005 located in Process Cell L-0126 at Elevation 3'-0". The following document is submitted to replace the document currently in Appendix 9.11.

Please note that one of the the integrity assessment reports being replaced (24590-CM-HC4-HXYG-00138-01-14) addressed ancillary equipment associated with both the LAW RLD and LAW Concentrate Receipt Process System (LCP) vessels. The other integrity assessment report (24590-CM-HC4-HXYG-00138-09) addressed ancillary equipment associated with RLD-VSL-00004. The new report is limited to only LAW RLD vessel ancillary equipment. The integrity assessment report specific to the LCP System vessel ancillary equipment is being transmitted separately under PCN 24590-LAW-PCN-ENV-07-008.

Appendix 9.11			
Replace:	24590-CM-HC4-HXYG-00138-01-09, Rev. 00B and 24590-CM-HC4-HXYG-00138-01-14, Rev. 00B	With:	IA-3001885-000 / CCN: 200242

This modification requests Washington State Department of Ecology (Ecology) approve and incorporate into the permit the above mentioned integrity assessment report. The report has been updated by the Independent Qualified Registered Professional Engineer (IQRPE). The report reflects the IQRPE's review of the following final design documents at the time of review:

- Facility and Vendor Fabrication Drawings, Mechanical Data Sheets, Material Selection Data Sheets, System Descriptions, and Design Calculations produced in accordance with References:
  - AISC Manual of Steel Construction, ASD, 9th Edition, American Institute of Steel Construction
  - ASME B16.5, Piping Flanges and Flanged Fittings, American Society of Mechanical Engineers
  - ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers
  - ASME Boiler and Pressure Vessel Code (B&PV), Section IX, Welding and Brazing Qualifications, American Society of Mechanical Engineers
  - ASME Boiler and Pressure Vessel Code, Section III, Division I, Rules for Construction of Nuclear Power Plant Components, American Society of Mechanical Engineers, 1995
  - ASTM Annual Book of ASTM Standards, American Society of Testing and Materials
  - MSS-SP-58, Pipe Hangers and Supports-Materials, Design, and Manufacture, Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.
  - Uniform Building Code (UBC), 1997
  - WAC 173-303, Washington Administrative Code, Chapter 173-303, *Dangerous Waste Regulations*
- 24590-LAW-P6C-RLD-00031, Rev. B, Pipe Stress Analysis for LAW RLD System
- 24590-LAW-PER-M-02-001, Rev. 5, LAW Facility Sump Data
- 24590-LAW-PHC-RLD-00013, Rev. A, Pipe Support Calculation (for Support No. LAW-RLD-H00001)
- 24590-LAW-PHC-RLD-00048, Rev. C, Pipe Support Calculation (for Support No. LAW-RLD-H00202)
- 24590-WTP-3DP-G04B-00037, Rev. 11A, Engineering Calculations
- 24590-WTP-3DP-G04T-00905, Rev. 8, Determination of Quality Levels
- 24590-WTP-3DP-G04T-00906, Rev. 6, Isometric Drawings and Associated Calculations
- 24590-WTP-3PS-MX00-T0001, Rev. 6, Engineering Specification for Process Bulge Design and Fabrication
- 24590-WTP-3PS-NN00-T0001, Rev. 1, Engineering Specification for Thermal Insulation for Mechanical Systems

Quarter Ending 12/31/2009 24590-LAW-PCN-ENV-07-011

- 24590-WTP-3PS-P000-T0001, Rev. 5, Engineering Specification for Piping Material Classes General Description and Summary
- 24590-WTP-3PS-PH01-T0002, Rev. 3, Installation of Pipe Supports
- 24590-WTP-DB-ENG-01-001, Rev. 1I, WTP Basis of Design
- 24590-WTP-DC-PS-01-001, Rev. 5, Pipe Stress Design Criteria Including "Pipe Stress Criteria" and "Span Method Criteria"
- 24590-WTP-DC-PS-01-002, Rev. 4, Pipe Support Design Criteria
- 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria
- 24590-WTP-GPG-ENG-004, Rev. 2A, Design Guide Pipe Stress, Pipe Layout, and Support Spacing
- 24590-WTP-GPG-ENG-005, Rev. 3B, Engineering Design Guide for Pipe Supports
- 24590-WTP-PER-M-02-002, Rev. 1, Materials for Ancillary Equipment
- 24590-WTP-PER-PL-02-001, Rev. 6, Piping Material Class Description
- 24590-WTP-PER-PR-03-001, Rev. 1, Prevention of Hydrogen Accumulation in WTP Tank Systems and Miscellaneous Treatment Units
- 24590-WTP-PER-PR-03-002, Rev. 3, Control of Toxic Vapors and Emissions from WTP Tank and Miscellaneous Unit Systems.
- 24590-WTP-PER-PS-02-001, Rev. 4, Ancillary Equipment Pipe Support Design
- 24590-WTP-PHC-P50-00001, Rev. 0, RPP/WTP Support Standards
- 24590-WTP-PHC-P50T-00001, Rev. 1, U-Bolt Load Capacity Calculation
- 24590-WTP-PHC-P50T-00002, Rev. 0, Justification for the Use of Standard Supports for RPP-WTP Project
- 24590-WTP-PHC-P50T-00004, Rev. 0, Qualification of Pipe Straps
- 24590-WTP-PL-PS-01-001, Rev. 1, Verification and Validation Test Plan for Bechtel's ME150 Pipe Support Family of Programs (PCFAPPS)
- 24590-WTP-SE-ENS-03-704, Rev. 0, Seismic Evaluation for Design (Seismic Design of Piping and Pipe Supports)

For each item of "Information Assessed" in the integrity assessment report, the items listed under the "Source of Information" column were reviewed and found to furnish adequate design controls and requirements to ensure the design fully satisfies the requirements of Washington Administrative Code, WAC-173-303-640, *Dangerous Waste Regulations*.

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number:

Enter wording of WAC 173-303-830, Appendix I Modification citation:

In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class [1]1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Modification Approved/Concur: [X] Yes [ ] Denied (state reason below)

Reason for denial:

Reviewed by Ecology:

K. Elsethagen 12-10-2009

Kelly Elsethagen Date

R11093706

AREVA

AFS-09-0265

CCN: 200242

July 21, 2009

RPP-WTP
RECEIVED
JUL 22 2009
BY PDC

Ms. Jennifer Broadbent
Subcontract Administrator
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Dear Ms. Broadbent:

BECHTEL NATIONAL, INC. CONTRACT NO. 24590-CM-HC4-HXYG-00211 IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAW RLD ANCILLARY EQUIPMENT (IA-3001885-000)

The structural integrity assessment of the subject ancillary equipment has been completed per the contract requirements and is enclosed for your use. The assessment found that the design is sufficient to ensure that the ancillary equipment is adequately designed and has sufficient structural strength, compatibility with the waste(s) to be processed/stored/treated, and corrosion protection to ensure that it will not collapse, rupture, or fail.

If you have any questions, please contact Tarlok Hundal at (509) 373-4438, or via email at tarlok.hundal@areva.com.

Sincerely,

Fred R. Renz
Contract Management
AREVA Federal Services LLC
Richland Office

llm

Enclosure (1)

cc: D. C. Pfluger, MS 5-L w/enclosure (2)

AREVA Federal Services LLC
2101 Horn Rapids Road, RC-19, Richland, WA 99354, P. O. Box 840, Richland, WA 99352
Tel.: 509 375 8096 - Fax: 509 375 8495 - www.areva.com

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAW RLD ANCILLARY EQUIPMENT

Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

IQRPE STRUCTURAL INTEGRITY ASSESSMENT REPORT FOR LAW RLD ANCILLARY EQUIPMENT

"I, Tarlok Hundal have reviewed, and certified a portion of the design of a new tank system or component located at the Hanford Waste Treatment Plant, owned/operated by Department of Energy, Office of River Protection, Richland, Washington. My duties were independent review of the current design for the LAW Radioactive Liquid Waste Disposal (RLD) System Ancillary Equipment, as required by the Washington Administrative Code, *Dangerous Waste Regulations*, Section WAC-173-303-640(3) (a) through (g) applicable components."

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

The documentation reviewed indicates that the design fully satisfies the requirements of the WAC.

The attached review is eleven (11) pages numbered one (1) through eleven (11).

Signature

7/21/09
Date

Scope	Scope of this Integrity Assessment	This Integrity Assessment addresses ancillary equipment associated with the Low Activity Waste (LAW) Radioactive Liquid Waste Disposal System (RLD) vessels (RLD-VSL-00003, RLD-VSL-00004, and RLD-VSL-00005) located in the LAW facility. The ancillary equipment such as pipelines, valves, and other items associated with these vessels are conspicuously delineated on the P&ID drawings 24590-LAW-M6-RLD-P0001, -P0002, and -P0003. The RLD vessels (RLD-VSL-00003 and RLD-VSL-00005) located at Elevation 2'-0" in Cell, Room L-0126 and RLD-VSL-00004 is located at El. (-) 21'-0" a C3/C5 Drain Collection Cell, Room L-B001B of the LAW facility. Ancillary equipment located inside the RLD system vessels is addressed separately in the Integrity Assessments for these plant items.
Summary of Assessment		For each item of "Information Assessed" (i.e., Criteria) on the following pages, the items listed under "Source of Information" were reviewed and found to furnish adequate design requirements and controls to ensure that the design fully satisfies the requirements of Washington Administrative Code (WAC), Chapter 173-303 WAC, *Dangerous Waste Regulations*, WAC-173-303-640, *Tank Systems*.

References	Drawings and System Description	Drawings: 24590-LAW-P1-P01T-00001, Rev. 3, LAW Vitrification Building General Arrangement Plan at El. (-) 21'- 0"; 24590-LAW-P1-P01T-00002, Rev. 5, LAW Vitrification Building General Arrangement Plan at El. 3'- 0"; 24590-LAW-P1-P01T-00007, Rev. 8, LAW Vitrification Building General Arrangement Sections A-A, B-B, C-C, and S-S; 24590-LAW-P1-P01T-00010, Rev. 8, LAW Vitrification Building General Arrangement Section K-K, L-L, and M-M; 24590-LAW-M6-RLD-P0001, Rev. 3, P&ID –LAW Radioactive Liquid Waste Disposal System Plant Wash and SBS Condensate Collection; 24590-LAW-M6-RLD-P0002, Rev. 3, P&ID –LAW Radioactive Liquid Waste Disposal System C3/C5 Drains/Sump Collection; 24590-LAW-M6-RLD-P0003, Rev. 3, P&ID –LAW Radioactive Liquid Waste Disposal System C3/C5 Floor Drains Collection; 24590-LAW-M6-RLD-00001, Rev. 5, P&ID –LAW Radioactive Liquid Waste Disposal System Plant Wash and SBS Condensate Collection; 24590-LAW-M6-RLD-00002, Rev. 5, P&ID –LAW Radioactive Liquid Waste Disposal System C3/C5 Drains/Sump Collection; 24590-LAW-M6-RLD-00003, Rev. 5, P&ID –LAW Radioactive Liquid Waste Disposal System C3/C5 Floor Drains Collection; 24590-LAW-M6-RLD-00004, Rev. 1, P&ID –LAW Radioactive Liquid Waste Disposal System HVAC Coils Condensate Drain System RLD/NLD; 24590-LAW-M6-RLD-00005, Rev. 1, P&ID –LAW Radioactive Liquid Waste Disposal System C3/C5 HVAC Drains; 24590-LAW-M5-V17T-00014, Rev. 5, Process Flow Diagram LAW Liquid Effluent (System RLD); 24590-LAW-P3-RLD-ZF33829001, Rev. 1, LAW Vitrification Isometric (Line No. RLD-ZF-33829-N11F-3); 24590-LAW-P3-RLD-GR00024001, Rev. 3, LAW Vitrification Isometric (Line No. RLD-GR-00024-S11P-1.5); 24590-LAW-P3-RLD-WS20033002, Rev. 0, LAW Vitrification Isometric (Line No. RLD-WS-20033-S11B-1); 24590-LAW-P3-RLD-WU02184001, Rev. 1, LAW Vitrification Isometric (Line No. RLD-WU-02184-S11B-4); 24590-LAW-P3-RLD-ZR04244001, Rev. 0, LAW Vitrification Isometric (Line No. RLD-ZR-04244-C14A-2); 24590-LAW-P3-RLD-ZF03440001, Rev. 3, LAW Vitrification Isometric (Line No. RLD-ZF-03440-N11F-2); 24590-LAW-P3-RLD-ZF00095001, Rev. 2, LAW Vitrification Isometric (Line No. RLD-ZF-00095-S11B-4); 24590-WTP-PH-50-00003001, Rev. 4, Standard Pipe Support Details Cantilever-Cantilever CC; 24590-WTP-PH-50-00004001, Rev. 4, Standard Pipe Support Details Frame - L Shape FL; 24590-WTP-PH-50-00012001, Rev. 6, Standard Pipe Support Details Guide – U Bolts GU; 24590-WTP-PH-50-00012002, Rev. 5, Standard Pipe Support Details Guide – U Strap GU; 24590-WTP-PH-50-00012003, Rev. 4, Standard Pipe Support Details Guide – U Strap GU; 24590-WTP-PH-50-00014001, Rev. 1, Standard Pipe Support Details Rod – Hangers RH; 24590-WTP-PH-50-00014002, Rev. 1, Standard Pipe Support Details Rod – Hangers RH; 24590-WTP-PH-50-00014003, Rev. 1, Standard Pipe Support Details Rod – Hangers RH; 24590-LAW-RLD-H00001, Rev. 0, Pipe Support Drawing; 24590-LAW-RLD-H00202, Rev. 0, Pipe Support Drawing. System Description: 24590-LAW-3YD-RLD-00001, Rev. 0, System Description for LAW Radioactive Liquid Waste Disposal (RLD) System.

Information Assessed		Source of Information	Assessment
Design	Ancillary equipment design standards are appropriate and adequate for the equipment's intended use.	Drawings and System Description listed above under References; 24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria;" ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers; 24590-WTP-3DP-G04T-00905, Rev. 10, Determination of Quality Levels.	The Pipe Stress Design Criteria identifies ASME B31.3 as the design code for piping systems of the WTP. The Process System Description document states that the RLD system does not have any important to safety function. Drawings show that the ancillary equipment is of commercial quality level (CM) grade and is Seismic Category SC-III/IV. Determination of Quality Levels document and Pipe Stress Design Criteria document provide detailed discussion of quality grades and seismic categories, respectively. The codes and standards used are acceptable and adequate for the design of the ancillary piping for the intended service.

Information Assessed		Source of Information	Assessment
Design (cont'd)	If the ancillary equipment to be used is not built to a design standard, the design calculations demonstrate sound engineering principles of construction.	Drawings and listed above under References; 24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria"; ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers; 24590-LAW-P6C-RLD-00031, Rev. D, Pipe Stress Analysis for LAW RLD System; 24590-LAW-PHC-RLD-00013, Rev. A, Pipe Support Calculation (for Support No. LAW-RLD-H00001); 24590-WTP-3PS-MX00-T0001, Rev. 6, Engineering Specification for Process Bulge Design and Fabrication; 24590-LAW-MXD-RLD-00002, Rev. 5, Mechanical Data Sheet for Process Bulge (RLD-BULGE-00004); 24590-CM-POA-PY33-00001-10-06, Rev. 00B, Containment Layout Drawing (RLD-BULBE-00001: Vendor Submittal; 24590-CM-POA-PY33-00001-09-01. 00B, Design Worksheet for Bulge (RLD-BULGE-00001): Vendor Submittal; 24590-CM-POA-MPH0-00001-05-01, Instructions for Pump Casing Hydrostatic Test: Vendor Submittal; 24590-WTP-3DP-G04T-00906, Rev. 7A, Isometric Drawings and Associated Calculations; 24590-WTP-3DP-G04B-00037, Rev. 15A, Engineering Calculations; 24590-WTP-3PS-PH01-T0002, Rev. 4, Installation of Pipe Supports.	The ancillary equipment is built to design standards. The Pipe Stress Design Criteria specifies that piping is to be designed in accordance with ASME B31.3 Code. The review of the sample isometric and pipe support drawings listed in the References, Pipe Stress Analysis, Pipe Support Calculation, Mechanical Data Sheet, Engineering Specification, Vendor Submittals approved by Bechtel National Inc. (BNI), and of the design process and controls described in Isometric Drawings and Associated Calculations, Engineering Calculations, and Installation of Pipe Supports documents provides adequate assurance that RLD ancillary equipment are properly designed, installed, and verified to meet the requirements of the applicable design criteria established for the project. The review of the aforementioned documents also demonstrates that sound design engineering principles are used for the design and construction of the ancillary equipment.

Information Assessed		Source of Information	Assessment
Design (cont'd)	Ancillary equipment has adequate strength at the end of its design life to withstand the operating pressure, operating temperature, thermal expansion, and seismic loads. Equipment is protected against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.	24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria;" ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers; ASME Boiler and Pressure Vessel Code, Section III, Division 1, Rules for Construction of Nuclear Power Plant Components, American Society of Mechanical Engineers, 1995; Uniform Building Code (UBC), 1997; 24590-WTP-PER-M-02-002, Rev. 2, Materials for Ancillary Equipment; 24590-WTP-GPG-ENG-004, Rev. 2A, Design Guide Pipe Stress, Pipe Layout and Support Spacing; 24590-WTP-SE-ENS-03-704, Rev. 0, Seismic Evaluation for Design (Seismic Design of Piping and Pipe Supports).	The Pipe Stress Design Criteria requires the use of the ASME B31.3 Code for process piping design. ASME B31.3 requires explicit consideration of operating pressure, operating temperature, thermal expansion/contraction, settlement, vibration, and corrosion allowance in the design of piping. For the seismic design of Seismic Category (SC-III/IV) ancillary equipment, applicable sections of ASME Section III, Division 1, Appendix F, and sections of Uniform Building Code (UBC) are used to supplement the requirements of ASME B31.3. Details of the seismic design methods are discussed in the Pipe Stress Design Criteria and Seismic Evaluation documents. These are appropriate and adequate codes and standards including the Design Guide document, to ensure that the ancillary equipment has adequate strength at the end of its design life to withstand all anticipated loads.

Information Assessed		Source of Information	Assessment
Supports	Ancillary equipment supports are adequately designed.	Drawings listed above under References; 24590-WTP-DC-PS-01-002, Rev. 4, Pipe Support Design Criteria; ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers; MSS-SP-58, Pipe Hangers and Supports-Materials, Design, and Manufacture, Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; AISC Manual of Steel Construction, ASD, 9th Edition, American Institute of Steel Construction; ASME Boiler and Pressure Vessel Code, Section III, Division 1, Rules for Construction of Nuclear Power Plant Components, American Society of Mechanical Engineers, 1995; Uniform Building Code (UBC), 1997; 24590-WTP-PER-PS-02-001, Rev. 4, Ancillary Equipment Pipe Support Design; 24590-WTP-PL-PS-01-001, Rev. 2, Verification and Validation Test Plan for Bechtel's ME150 Pipe Support Family of Programs (PCFAPPS); 24590-LAW-PHC-RLD-00013, Rev. A, Pipe Support Calculation (for Support No. LAW-RLD-H00001); 24590-LAW-PHC-RLD-00048, Rev. C, Pipe Support Calculation (for Support No. LAW-RLD-H00202); 24590-WTP-GPG-ENG-005, Rev. 4A, Engineering Design Guide for Pipe Supports; 24590-WTP-PHC-P50T-00002, Rev. 1, Justification for the use of Standard Supports for RPP-WTP-Project; 24590-WTP-PHC-P50T-00001, Rev. 1, U-Bolt Load Capacity Calculation; 24590-WTP-3DP-G04T-00906, Rev. 7A, Isometric Drawings and Associated Calculations; 24590-WTP-3DP-G04B-00037, Rev. 15A, Engineering Calculations; 24590-WTP-PHC-P50-00001, Rev. 1, RPP/WTP Support Standards; 24590-WTP-PHC-P50T-00004, Rev. 0, Qualification of Pipe Straps; 24590-WTP-SE-ENS-03-704, Rev. 0, Seismic Evaluation for Design (Seismic Design of Piping and Pipe Supports).	The Pipe Support Design Criteria document considers all loadings identified in ASME B31.3 including MSS-SP-58 and AISC Manual and also utilizes ASME B&PV Code, Section III, Division 1, Appendix F, to supplement the requirements of ASME B31.3 for seismic design of Seismic Category (SC-III/IV) pipe supports. Bounding load cases are passed to the pipe support designers from the results of the ancillary equipment piping stress analyses. Details of the seismic design methodology are discussed in the Pipe Support Design Criteria document. Examples of typical ancillary equipment supports are shown in the Ancillary Equipment Pipe Support Design document. Analysis is by manual calculation or approved computer programs that have been verified and validated. These are appropriate codes and standards for design of ancillary equipment supports for the RLD system. Ancillary equipment supports are to be designed to allow a minimum of heat to be transferred to the building structures such that the temperature of the building structures does not exceed 150°F for the concrete structure and 200°F for the steel structure. The review of the sample isometric drawings, pipe support drawings, Pipe Support Calculations, and that of the design process and controls described in Isometric Drawings and Associated Calculations, Engineering Calculation and other supports associated documents, provides sufficient assurance that RLD ancillary equipment supports are adequately designed, installed, and verified to meet the requirements of the applicable design criteria established for the project.

Information Assessed		Source of Information	Assessment
Foundations	The system will withstand the effects of frost heave.	Drawings listed above under References; 24590-WTP-DC-ST-01-001, Rev. 12, Structural Design Criteria.	The Structural Design Criteria requires that all outdoor equipment structural foundations shall extend into the surrounding soil below the 30" frost line to preclude frost heave. The RLD ancillary equipment system considered in this assessment is located inside the LAW facility. The LAW facility structural foundations are well below the grade elevation, therefore, the RLD system is not subjected to any frost heave effects.
Connections	Seams and connections are adequately designed.	24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria;" ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers; ASME B16.5, Piping Flanges and Flanged Fittings, American Society of Mechanical Engineers; ASME Boiler and Pressure Vessel Code (B&PV), Section IX, Welding and Brazing Qualifications, American Society of Mechanical Engineers.	The Pipe Stress Design Criteria specifies the ASME B31.3 Process Piping design code for the piping systems. Welding is to be performed in accordance with the requirements of ASME B31.3 and the ASME B&PV Code, Section IX. ASME B16.5 is specified for flange designs. These are appropriate codes and standards for design and fabrication of the RLD System ancillary equipment.
Waste Characteristics	Characteristics of the waste to be stored or treated have been identified (ignitable, reactive, toxic, specific gravity, vapor pressure, flash point, temperature)	System Description listed above under References; 24590-WTP-PER-PR-03-001, Rev. 1, Prevention of Hydrogen Accumulation in WTP Tank Systems and Miscellaneous Treatment Unit Systems; 24590-WTP-PER-PR-03-002, Rev. 3, Control of Toxic Vapors and Emissions from WTP Tank Systems and Miscellaneous Unit Systems.	The Prevention of Hydrogen Accumulation in WTP Tank Systems and Miscellaneous Treatment Unit System and System Description documents indicate that flammable or explosive concentrations of hydrogen are not expected in the LAW facility systems ancillary equipment. Similarly, the Control of Toxic Vapors and Emissions from WTP Tank Systems and Miscellaneous Unit Systems document provides a summary of the LAW facility ancillary equipment design features that provide for confinement and treatment of chronically toxic vapors and emissions during normal operations, abnormal operations, and during and after a Design Basis seismic event. The above mentioned documents appropriately identify the characteristic of the waste to be handled by the RLD system.

Information Assessed		Source of Information	Assessment
Waste Characteristics (cont'd)	Ancillary equipment is designed to handle the wastes with the characteristics defined above and any treatment reagents.	24590-WTP-PER-M-02-002, Rev. 2, Materials for Ancillary Equipment.	The Materials for Ancillary Equipment document specifies that ancillary equipment materials that contact the waste are to be equal to or better than those of the upstream source vessels. Selection of proper material for the RLD piping and equipment ensures that the ancillary equipment is appropriately designed to handle the waste.
Compatibility	The pH range of the waste, waste temperature and the corrosion behavior of the structural materials are adequately addressed. Ancillary equipment material and protective coatings ensure the ancillary equipment structure is adequately protected from the corrosive effects of the waste stream and external environments. The protection is sufficient to ensure the equipment will not leak or fail for the design life of the system.	24590-WTP-DB-ENG-01-001, Rev. 1N, Basis of Design; 24590-WTP-PER-M-02-002, Rev. 1, Materials for Ancillary Equipment; 24590-WTP-3PS-NN00-T0001, Rev. 2, Engineering Specification for Thermal Insulation for Mechanical Systems; ASTM Annual Book of ASTM Standards, American Society of Testing and Materials.	The Basis of Design document identifies a service design life of 40 years for the ancillary equipment. Detailed materials selection (corrosion) evaluations are conducted for each vessel in the LAW facility during process design to assure a 40-year service life. The Materials for Ancillary Equipment document requires that the material selection and corrosion/erosion allowances for ancillary equipment in contact with the waste will be equal to or better than the material and corrosion allowance of the waste source vessel. The Thermal Insulation specification requires that all insulating materials used on the outside of ancillary equipment be pre-approved for use on austenitic stainless steel in accordance with applicable ASTM standards and tests to preclude external corrosion of ancillary equipment. Therefore, the ancillary equipment will provide the expected design service life.

Information Assessed		Source of Information	Assessment
Corrosion Allowance	Corrosion allowance is adequate for the intended service life of the ancillary equipment.	System Description listed above under References; ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers; 24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria;" 24590-WTP-DB-ENG-01-001, Rev. 1N, Basis of Design; 24590-WTP-PER-M-02-002, Rev. 2, Materials for Ancillary Equipment; 24590-WTP-PER-PL-02-001, Rev. 6, Piping Material Class Description.	ASME B31.3 is the design code for the WTP piping. Consideration of corrosion, including corrosion allowance, is a mandatory requirement of ASME B31.3 and is appropriately supplemented in the Pipe Stress Design Criteria document. A required service life of 40 years is identified in the Basis of Design for ancillary equipment. Detailed materials selection (corrosion) evaluations are conducted for each vessel in the LAW facility during process design to ensure a 40-year service life. The Materials for Ancillary Equipment document requires that downstream ancillary equipment is to be constructed of equal or better materials, and with the same corrosion allowance as the source vessel. Corrosion/Erosion allowances are listed for the ancillary equipment (each piping class and associated valves, fittings, etc.) in the Piping Material Class Description document.
Pressure Controls	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the vessels are exceeded.	24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria;" ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers.	The Pipe Stress Design Criteria document specifies ASME B31.3 as the design code for the WTP piping. ASME B31.3 requires provision be made to safely contain or relieve any pressure to which the piping may be subjected. ASME B31.3 piping not protected by a pressure relieving device, or that can be isolated from a pressure reliving device must be designed for at least the highest pressure that can be developed.

Information Assessed		Source of Information	Assessment
Pressure Controls (cont'd)	Maximum flows and any unusual operating stresses are identified	Drawings listed above under References; 24590-WTP-DC-PS-01-001, Rev. 6, Pipe Stress Design Criteria including "Pipe Stress Criteria" and "Span Method Criteria;" ASME B31.3 Code, Process Piping, 1996 Edition, American Society of Mechanical Engineers; 24590-WTP-3PS-P000-T0001, Rev. 6, Engineering Specification for Piping Material Classes General Description and Summary; 24590-WTP-PER-PL-02-001, Rev. 6, Piping Material Class Description; 24590-WTP-3DP-G04T-00906, Rev. 7A, Isometric Drawings and Associated Calculations; 24590-WTP-3DP-G04B-00037, Rev. 15A, Engineering Calculations.	The expected flow paths for the ancillary equipment are identified on the P&ID drawings. The Pipe Stress Design Criteria specifies the ASME B31.3 code for piping design. This code requires piping to be designed to the highest pressure that can be developed in a piping system assuring that maximum operating stresses remain within code allowables. Piping material classes are shown on the P&ID drawings, embedded in the item numbers for each ancillary equipment component. Each ancillary equipment is designed for the highest anticipated temperature and pressure values which are also within the bounding maximum design temperature and pressure values listed for each piping material class in the Piping Material Class General Description document. ASME B31.3 and the associated standards are appropriate and adequate for the design of the ancillary equipment. Furthermore, the fabrication or isometric drawings released for construction by Bechtel National, Inc. (BNI), and the design process and controls described in the Isometric Drawings and Associated Calculations, and Engineering Calculations documents provides adequate assurance that subject ancillary equipment are properly designed, installed, and verified to meet the requirements identified in the applicable design criteria established for the project.

Information Assessed		Source of Information	Assessment
Secondary Containment	Ancillary equipment is designed with secondary containment that is constructed of materials compatible with the waste and of sufficient strength to prevent failure (pressure gradients, waste, climatic conditions, daily operations), provided with a leak-detection system, and designed to drain and remove liquids.	Drawings listed above under References; 24590-LAW-PER-M-02-001, Rev. 5, LAW Facility Sump Data; WAC 173-303, Washington Administrative Code, Chapter 173-303, *Dangerous Waste Regulations.*	The ancillary equipment considered in this assessment is located in and between areas R3/C5 (Room L-B001B) and R5/C5 (Room L-0126), within the LAW building. These LAW rooms are secondary containment concrete structures provided with stainless steel liner plates and sumps (RLD-SUMP-00028, RLD-SUMP-00035, and RLD-SUMP-00036), as shown on the general arrangement drawings and in Sump Data document. The structural integrity assessment of the above mentioned secondary containment structures is outside the scope of this assessment, however, it is conducted in a separate document. It should also be noted that the drawings show that various welded piping spools of the RLD ancillary system route through numerous C2/C3 corridors and rooms before entering the above listed rooms where the RLD vessels are located. These corridors and rooms are not equipped with secondary containment features. Therefore, ancillary equipment located in these rooms and corridors will require daily visual inspections for leaks, as delineated in WAC-173-303-640(4)(f)(ii).

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Quarter Ending 12/31/2009 24590-LAW-PCN-ENV-08-002

Hanford Facility RCRA Permit Modification Notification Form

Part III, Operating Unit 10

Waste Treatment and Immobilization Plant

Index

Page 2 of 2: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant
Update Equipment Assembly Drawing for LVP-TK-00001 in Appendix 9.6 of the Dangerous Waste Permit

Submitted by Co-Operator: Reviewed by ORP Program Office:

DMBusche 9/17/09 Sept 23, 2009

D. M. Busche Date G. A. Girard Date

Quarter Ending 12/31/2009

24590-LAW-PCN-ENV-08-002

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part:
Waste Treatment and Immobilization Plant	**Part III, Operating Unit 10**

Description of Modification:

The purpose of this Class 1 modification is to update LAW Vitrification Equipment Assembly Drawing for LVP-TK-00001 in Appendix 9.6 of the Dangerous Waste Permit. The following Mechanical Drawing is submitted to replace the drawing currently in Appendix 9.6.

Appendix 9.6			
Replace:	24590-LAW-MT-LVP-P0004, Rev 0	With:	24590-LAW-MT-LVP-00004, Rev 1

This modification requests Ecology approval and incorporation into the permit the specific changes to this Mechanical Drawing that are identified by notes 2 and 7, clouds, and revision triangles shown on the Mechanical Drawing that has been issued since the last revision of the permit version. Revisions are the result of ongoing design. The following identifies the significant types of changes on the attached drawing:

- Added note 7 summarizing changes:
  - Added nozzle N5A and detail 2
  - Revised nozzle locations, size, and Z-dimensions
  - Revised nozzle table base
  - Revised plan and elevation and detail 1
  - Revised note 2

The following is a list of outstanding change documents that have not been incorporated into this modification:

- 24590-LAW-MTN-LVP-00001

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number:

Enter wording of WAC 173-303-830, Appendix I Modification citation:

In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class [1]1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Modification Approved/Concur: [X] Yes [ ] Denied (state reason below)

Reason for denial:

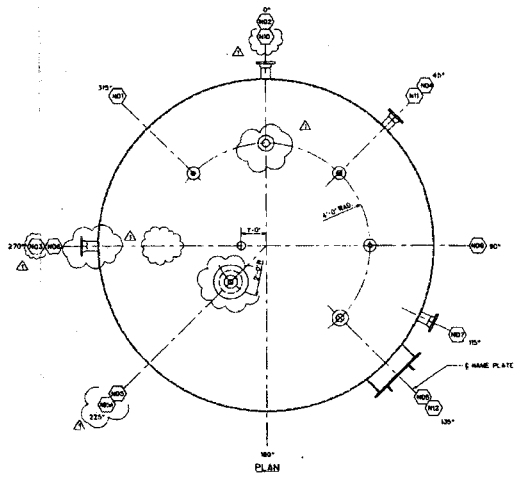
Reviewed by Ecology:

K. Elsethagen — Kelly Elsethagen

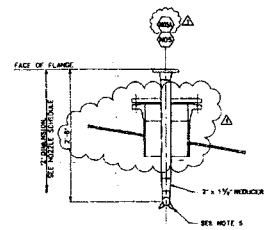
10-29-2009 — Date

NOZZLE	SIZE	SCHEDULE/WALL	CLASS	TYPE	SERVICE/REMARKS	ELEVATION	REF DWG/DET	CONN PIPE SIZE/SCHED
N01	8"	80S	150	RF/WN	INLET	0'-6"	24590-WTP-MV-M561-00006001 DET. 11	N/A
N02	8"	80S	150	RF/WN	OUTLET	0'-6"	24590-WTP-MV-M561-00006001 DET. 8	N/A
N03	8"	80S	150	RF/WN	OUTLET	0'-6"	24590-WTP-MV-M561-00006001 DET. 8	N/A
N04	4"	80S	150	RF/WN	DRAIN/FILL	FLR	24590-WTP-MV-M561-00006001 DET. 10	N/A
N05	16"	80S	150	RF/WN	MANWAY	13'-0"	24590-WTP-MV-M561-00006001 DET. 1	16 DIA FLANGE
N06A	3"	80S	150	RF/WN	SPRAY NOZZLE	8'-4"	24590-WTP-MV-M561-00006001 DET. 9	FLANGED
N06	3"	80S	150	RF/WN	SPRAY	8'-4"	24590-WTP-MV-M561-00006001 DET. 9	N/A
N07	3"	80S	150	RF/WN	LEVEL INSTRUMENT	FLR	24590-WTP-MV-M561-00006001 DET. 8	N/A
N08	3"	80S	150	RF/WN	RECIRCULATION INLET	10'-4"	24590-WTP-MV-M561-00006001 DET. 9	N/A
N09	3"	80S	150	RF/WN	PROCESS WATER INLET	10'-4"	24590-WTP-MV-M561-00006001 DET. 9	N/A
N10	3"	80S	150	RF/WN	SPARE	11'-8"	24590-WTP-MV-M561-00006001 DET. 9	6" IN DIA FLANGE
N11	2"	80S	150	RF/WN	SPARE	11'-4"	24590-WTP-MV-M561-00006001 DET. 9	6" IN DIA FLANGE
N12	24"	PLATE	API 650		SHELL MANWAY	4'-0"	N/A	API 650

(HOLD)



PLAN



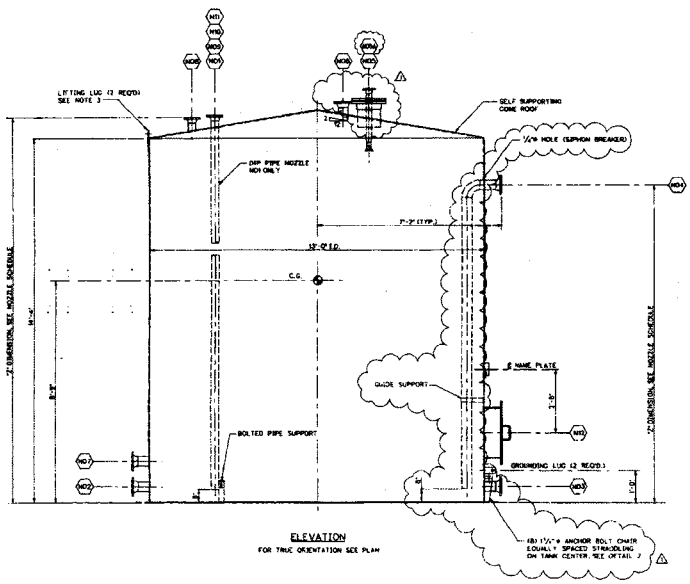
DETAIL "1"

GENERAL NOTES

1. "2" DIMENSION FOR SHELL NOZZLE MEASURED FROM CENTER LINE OF NOZZLE FACE.
2. SELLER TO DESIGN BASE PLATE AND ANCHOR BOLT CHAIRS. WITH BOLT CIRCLE DIAMETER OF 13'-6"
3. SELLER TO DESIGN AND FURNISH LIFTING LUGS.
4. ALL THE THICKNESSES AND SCHEDULE / WALL THICKNESS SHOWN ON THE NOZZLE TABLE ARE MINIMUM. SELLER TO CONFIRM THE ACTUAL WALL THICKNESS TO BE USED.
5. SELLER TO PROVIDE THE INTERNAL SPRAY JET NOZZLE (MODEL GAMJET V12) FOR NOZZLE N06.
6. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING
7. REVISED/DELETED/ADDED:
   a) ADDED NOZZLE N06A & DETAIL 2
   b) REVISED NOZZLE TABLE BASE ON IF & ID REVISION
   c) REVISED PLAN AND ELEVATION & DETAIL 1
   d) REVISED NOTE 2

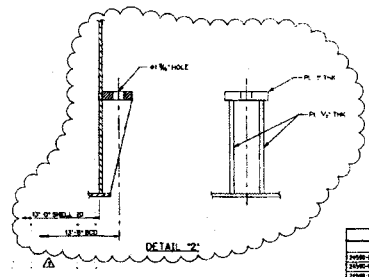
HOLDS

1. LIFTING LUG LOCATIONS PENDING REVIEW BY CONSTRUCTION.
2. GROUNDING LUG LOCATION PENDING REVIEW BY ELECTRICAL GROUP.
3. FINAL NOZZLE ORIENTATIONS AND ELEVATIONS PENDING CONFIRMATION BY PLANT DESIGN.



ELEVATION

FOR TRUE ORIENTATION SEE PLAN



DETAIL "2"

THIS DRAWING TO BE READ IN CONJUNCTION WITH THE MECHANICAL DATA SHEET NO 24590-LAW-MTD-LVP-00001

REFERENCE DRAWINGS		
DWG NO	REV	TITLE
24590-LAW-MS-LVP-00001	1	PLAN
24590-WTP-MV-M561-00006	1	PROCESS MECHAL TOLERANCES STANDARD DETAILS
24590-WTP-MV-M561-00002	1	GROUNDING LUG STANDARD DETAILS
24590-WTP-MV-M561-00006001	1	MECHAL CONNECTIONS STANDARD DETAILS SHEET 1 of 3

REV	DESCRIPTION	ORIG	CHKD	REVIEWED	APPD	DATE
1	REVISED SEE NOTE 7, REISSUED FOR PURCHASE					5/3/07
0	ISSUED FOR PURCHASE	KC/JESSAR	ID	MP		4-16-2004

REVISION HISTORY

CM

QUALITY LEVEL:

PROJECT No. 24590
REC
MR-1 SSCC
DRAWING No. 10

ORIGINATOR C. CHANG / KENNY 11-6-03
CHECKED C. SUPPER, SANDERS 11-6-03
APPROVED M. MEPHERSON 11-6-03
REVIEWED T. BRADNY 11-6-03

CONTRACT NO. DE-AC27-01RV14136

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99352

CONTRACTOR

EQUIPMENT ASSEMBLY
LAW CAUSTIC COLLECTION TANK
LVP-TK-00001

24590-LAW-MT-LVP-00004

REV 1

SIZE A1 | SCALE 1:20 | SHEET 1 OF 1

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Quarter Ending 12/31/2009 24590-LAW-PCN-ENV-08-003

Hanford Facility RCRA Permit Modification Notification Form

Part III, Operating Unit 10

Waste Treatment and Immobilization Plant

Index

Page 2 of 2: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant
Update LAW Vitrification Building General Arrangement Plan at Elevation -21 feet in Appendix 9.4 of the Dangerous Waste Permit.

Submitted by Co-Operator:

D. M. Busche 10/1/09
D. M. Busche Date

Reviewed by ORP Program Office:

G. A. Girard 10/22/09
G. A. Girard Date

Quarter Ending 12/31/2009 24590-LAW-PCN-ENV-08-003

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part:
Waste Treatment and Immobilization Plant	**Part III, Operating Unit 10**

Description of Modification:

The purpose of this Class 1 prime modification is to update LAW Vitrification Building General Arrangement Plan at Elevation -21 feet in Appendix 9.4 of the Dangerous Waste Permit. The following General Arrangement Drawing is submitted to replace the General Arrangement Drawing currently in Appendix 9.4.

Appendix 9.4			
Replace:	24590-LAW-P1-P01T-00001, Rev. 2	With:	24590-LAW-P1-P01T-00001, Rev. 3

This modification requests Ecology approval and incorporation into the permit the specific changes to this General Arrangement Drawing that are identified by notes 3, 4, and 5, clouds, and revision triangles shown on the General Arrangement Drawing that has been issued since the last revision of the version in the permit. Revisions are the result of ongoing design. The following identifies the significant types of changes on the attached drawings:

- Deleted note 8
- Added note 3 summarizing changes
  - Added gypsum board wall at col. G/11
  - Added a partial plan (pour caves) at El. -21'-0"
  - Revised ADR revision number (from rev. 1 to rev. 2)
  - Incorporated several drawing and field change notices
  - Revised power supply size based on vendor data and moved related equipment to make room
- Added note 4 citing revised radiation/contamination classifications
- Added note 5 clarifying the use and role of room numbers

The following is a list of outstanding change documents that have not been incorporated into this modification:

- 24590-LAW-A1N-A10T-00002
- 24590-LAW-A1N-A10T-00003
- 24590-LAW-A1N-A10T-00004
- 24590-LAW-A1N-A10T-00016
- 24590-WTP-FC-C-08-0749

WAC 173-303-830 Modification Class:	Class 1	Class 11	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number:

Enter wording of WAC 173-303-830, Appendix I Modification citation:

Enter wording of WAC 173-303-830, Appendix I Modification citation:

In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class 11 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Modification Approved/Concur: [X] Yes [ ] Denied (state reason below)

Reason for denial:

Reviewed by Ecology:

Kelly Elsethagen 10/30/09 Date

Quarter Ending June 30, 2009 24590-PTF-PCN-ENV-08-024

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 3 Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant
Update Piping and Instrumentation Diagrams (P&ID) for the PTF Cesium Ion Exchange System (CXP) in Appendix 8.2 of the Dangerous Waste Permit.

Submitted by Co-Operator:

D. M. Busche — Date: 4/30/09

Reviewed by ORP Program Office:

S. J. Olinger — Date: 5/28/09

Quarter Ending June 30, 2009 24590-PTF-PCN-ENV-08-024

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part:
Waste Treatment and Immobilization Plant	**Part III, Operating Unit 10**

Description of Modification:

The purpose of this Class 1 prime modification is to update the Piping and Instrumentation Diagrams (P&ID) for the PTF Cesium Ion Exchange System (CXP) in Appendix 8.2 of the Dangerous Waste Permit. The nine permit P&IDs incorporated into the DWP are being replaced with 31 source P&IDs as indicated in the Table below. The additional drawings are the result of converting each source drawing into multiple sheets in an effort to provide clearer representation of the CXP system, including additional details for instrumentation and logic controls.

In addition, this PCN includes five Cesium Resin Addition Process System (CRP) P&IDs that show several CXP/CRP lines (located inside CRP-BULGE-00001) that may transfer contaminated resin with water from the Resin Dewatering Process system, making it subject to dangerous waste regulations.

The following P&IDs are submitted to update the P&IDs in Appendix 8.2.

Appendix 8.2			
Replace:	24590-PTF-M6-CXP-P0001, Rev. 0	With:	24590-PTF-M6-CXP-00001001, Rev. 0
			24590-PTF-M6-CXP-00001002, Rev. 0
			24590-PTF-M6-CXP-00001003, Rev. 0
			24590-PTF-M6-CXP-00001004, Rev. 0
			24590-PTF-M6-CXP-00001005, Rev. 0
	24590-PTF-M6-CXP-P0002, Rev. 0		24590-PTF-M6-CXP-00002001, Rev. 0
			24590-PTF-M6-CXP-00002002, Rev. 0
	24590-PTF-M6-CXP-P0003, Rev. 0		24590-PTF-M6-CXP-00003001, Rev. 0
			24590-PTF-M6-CXP-00003002, Rev. 0
			24590-PTF-M6-CXP-00003003, Rev. 0
	24590-PTF-M6-CXP-P0005, Rev. 0		24590-PTF-M6-CXP-00005001, Rev. 0
			24590-PTF-M6-CXP-00005002, Rev. 0
			24590-PTF-M6-CXP-00005003, Rev. 0
			24590-PTF-M6-CXP-00005004, Rev. 0
	24590-PTF-M6-CXP-P0007, Rev. 0		24590-PTF-M6-CXP-00007, Rev. 2
	24590-PTF-M6-CXP-P0010, Rev. 0		24590-PTF-M6-CXP-00010001, Rev. 0
			24590-PTF-M6-CXP-00010002, Rev. 0
			24590-PTF-M6-CXP-00010003, Rev. 0
			24590-PTF-M6-CXP-00010004, Rev. 0
	24590-PTF-M6-CXP-P0011, Rev. 0		24590-PTF-M6-CXP-00011001, Rev. 0
			24590-PTF-M6-CXP-00011002, Rev. 0
			24590-PTF-M6-CXP-00011003, Rev. 0
			24590-PTF-M6-CXP-00011004, Rev. 0
			24590-PTF-M6-CXP-00011005, Rev. 0
			24590-PTF-M6-CXP-00011006, Rev. 0
			24590-PTF-M6-CXP-00011007, Rev. 0
	24590-PTF-M6-CXP-P0012, Rev. 0		24590-PTF-M6-CXP-00012001, Rev. 0
			24590-PTF-M6-CXP-00012002, Rev. 0
			24590-PTF-M6-CXP-00012003, Rev. 0
			24590-PTF-M6-CXP-00012004, Rev. 0
	24590-PTF-M6-CXP-P0013, Rev. 0		24590-PTF-M6-CXP-00013, Rev. 2
	N/A		24590-PTF-M6-CRP-00003001 Rev 0
	N/A		24590-PTF-M6-CRP-00003002 Rev 0
	N/A		24590-PTF-M6-CRP-00003003 Rev 0

Quarter Ending June 30, 2009 24590-PTF-PCN-ENV-08-024

	N/A		24590-PTF-M6-CRP-00003004 Rev 0
	N/A		24590-PTF-M6-CRP-00003005 Rev 0

This modification requests Ecology approval and incorporation into the permit the changes provided in applicable document change forms (e.g., DCN, SCN, SDDR, FCN, FCR, etc.) and changes associated with the resolution to comments on change documents since the issuance of the last revision of the permitted drawing.

The following types of changes apply to the CXP P&IDs:

- Drawing converted from a single sheet to multi-sheet drawings.
- Modified, deleted, and added notes and references
- Revised piping configuration and in-line components
- Modified, identified, and added support/utility system lines, valves, in-line components, instruments and logic controls
- Revised, identified, and added quality level and seismic designations
- Revised, identified, and added slope symbols and/or the slope requirement

The following is a list of outstanding change documents that have not been incorporated into this modification:

- 24590-PTF-M6N-M80T-00054 (addresses P&IDs 24590-PTF-M6-CXP-00005001, 24590-PTF-M6-CRP-00003001)
- 24590-PTF-M6N-M80T-00055 (addresses P&IDs 24590-PTF-M6-CXP-00012004, 00013)
- 24590-PTF-M6N-M80T-00059 (addresses P&IDs 24590-PTF-M6-CXP-00007, 00013)
- 24590-PTF-M6N-10-00004 (addresses P&IDs 24590-PTF-M6-CXP-00007, 00011007, 00012004, 00013)
- 24590-PTF-M6N-10-00005 (addresses P&IDs 24590-PTF-M6-CXP-00005001, 00005002, 00005003, 00005004, 00011001, 00011002, 00011003, 00011004, 00011005, 00011006, 00012001, 00012002, 00012003)
- 24590-PTF-M6N-CRP-00014 (addresses P&IDs 24590-PTF-M6-CRP-00003001, 00003002, 00003003, 00003004, 00003005)
- 24590-PTF-M6N-CRP-00016 (addresses P&ID 24590-PTF-M6-CRP-00003001)
- 24590-PTF-M6N-CRP-00017 (addresses P&IDs 24590-PTF-M6-CRP-00003001, 00003002, 00003003, 00003004, 00003005)
- 24590-PTF-M6PR-10-00002 (addresses P&IDs 24590-PTF-M6-CXP-00011007, 00012004)
- 24590-PTF-M6PR-CRP-00001 (addresses P&IDs 24590-PTF-M6-CRP-00003002, 00003003, 00003004, 00003005)

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number: NA

Enter wording of WAC 173-303-830, Appendix I Modification citation:

In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class [1]1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Modification Approved/Concur: [X] Yes [ ] Denied (state reason below)

Reason for denial:

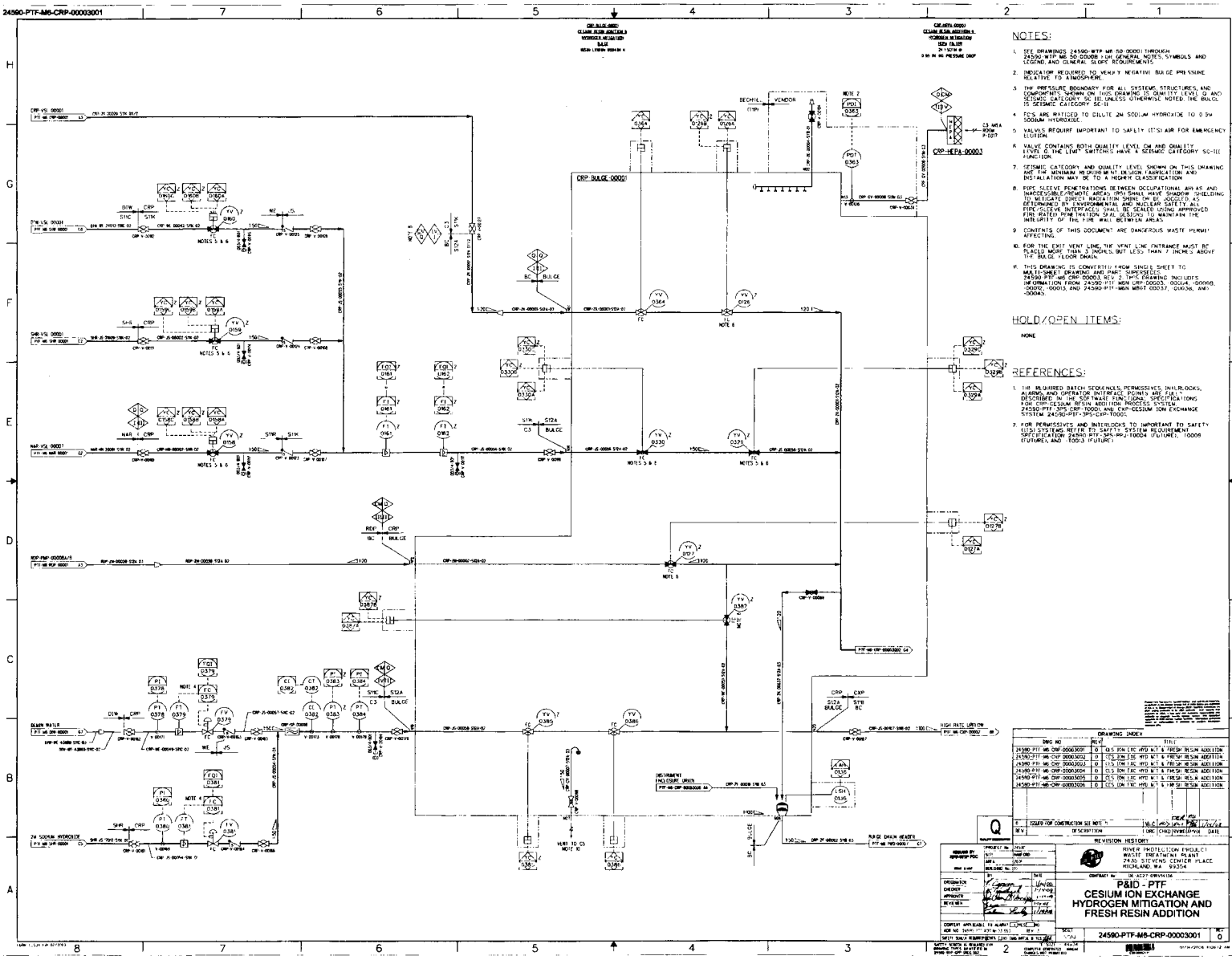
Reviewed by Ecology:

K Elsethagen 11-24-2009

~~Ed Fredenburg~~ Date

Kelly Elsethagen

24590-PTF-M6-CRP-00003001



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. INDICATOR REQUIRED TO VERIFY NEGATIVE BULGE PRESSURE RELATIVE TO ATMOSPHERE.
3. THE PRESSURE BOUNDARY FOR ALL SYSTEMS, STRUCTURES, AND COMPONENTS SHOWN ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC III, UNLESS OTHERWISE NOTED. THE BULGE IS SEISMIC CATEGORY SC-II.
4. FCS ARE RATIGED TO DILUTE 24% SODIUM HYDROXIDE TO 0.5% SODIUM HYDROXIDE.
5. VALVES REQUIRE IMPORTANT TO SAFETY (ITS) AIR FOR EMERGENCY ELUTION.
6. VALVE CONTAINS BOTH QUALITY LEVEL QM AND QUALITY LEVEL Q. THE LIMIT SWITCHES HAVE A SEISMIC CATEGORY SC-II(I) FUNCTION.
7. SEISMIC CATEGORY AND QUALITY LEVEL SHOWN ON THIS DRAWING ARE THE MINIMUM REQUIREMENT DESIGN, FABRICATION AND INSTALLATION MAY BE TO A HIGHER CLASSIFICATION.
8. PIPE SLEEVE PENETRATIONS BETWEEN OCCUPATIONAL AREAS AND INACCESSIBLE/REMOTE AREAS (IRA) SHALL HAVE SHADOW SHIELDING TO MITIGATE DIRECT RADIATION SHINE ON IRA. ADDITIONALLY, PENETRATIONS BETWEEN ENVIRONMENTAL AND NUCLEAR SAFETY ALL PIPING PENETRATIONS SHALL BE SEALED USING APPROVED FIRE RATED PENETRATION SEAL DESIGNS TO MAINTAIN THE INTEGRITY OF THE FIRE WALL BETWEEN AREAS.
9. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
10. FOR THE EXIT VENT LINE, THE VENT LINE ENTRANCE MUST BE PLACED MORE THAN 3 INCHES, BUT LESS THAN 7 INCHES ABOVE THE BULGE FLOOR DRAIN.
11. THIS DRAWING IS CONVERTED FROM SINGLE SHEET TO MULTI-SHEET DRAWING AND PART SUPERSEDES 24590-PTF-M6-CRP-00003, REV. 2. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-CRP-00003, -00004, -00008, -00010, -00013, AND 24590-PTF-M6N-MRHT-00037, -00038, AND -00043.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE SOFTWARE FUNCTIONAL SPECIFICATIONS FOR CRP-CESIUM RESIN ADDITION PROCESS SYSTEM, 24590-PTF-3PS-CRP-T0001, AND EXP-CESIUM ION EXCHANGE SYSTEM 24590-PTF-3PS-CRP-T0001.
2. FOR PERMISSIVES AND INTERLOCKS TO IMPORTANT TO SAFETY (ITS) SYSTEMS, REFER TO SAFETY SYSTEM REQUIREMENT SPECIFICATION 24590-PTF-3PS-RPU-T0004 (FUTURE), T0008 (FUTURE), AND -T0013 (FUTURE).

DRAWING INDEX

DWG NO	REV	TITLE
24590-PTF-M6-CRP-00003001	0	C3 ION EXC HPD W/ 1 & FRESH RESIN ADDITION
24590-PTF-M6-CRP-00003002	0	C3 ION EXC HPD W/ 1 & FRESH RESIN ADDITION
24590-PTF-M6-CRP-00003003	0	C3 ION EXC HPD W/ 1 & FRESH RESIN ADDITION
24590-PTF-M6-CRP-00003004	0	C3 ION EXC HPD W/ 1 & FRESH RESIN ADDITION
24590-PTF-M6-CRP-00003005	0	C3 ION EXC HPD W/ 1 & FRESH RESIN ADDITION
24590-PTF-M6-CRP-00003006	0	C3 ION EXC HPD W/ 1 & FRESH RESIN ADDITION

REV	DESCRIPTION	DRC	CHKD	ENGR	PROJ	DATE
0	ISSUED FOR CONSTRUCTION SEE NOTE 11					

REVISION HISTORY

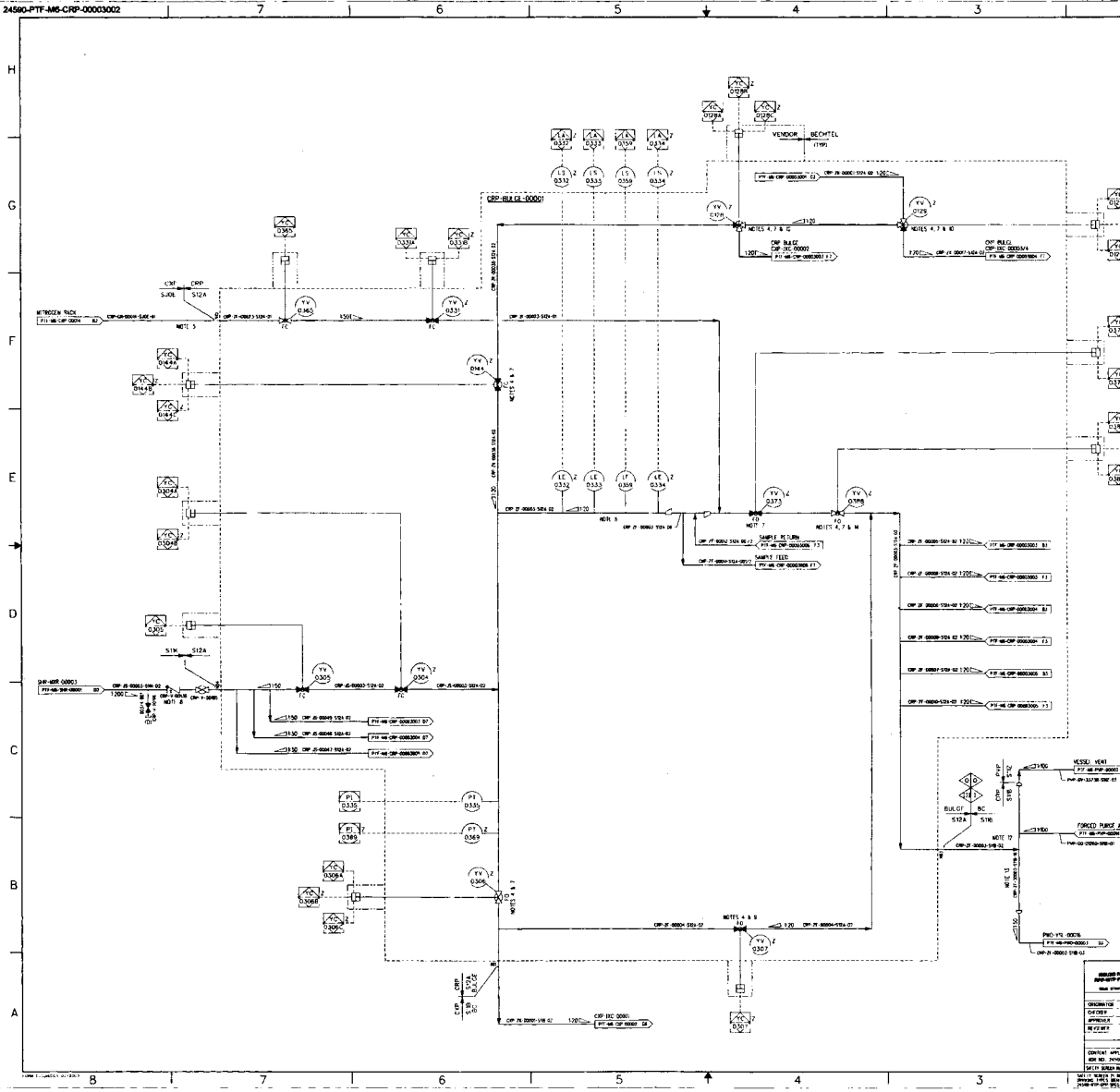
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE HYDROGEN MITIGATION AND FRESH RESIN ADDITION

24590-PTF-M6-CRP-00003001 REV 0

24590-PTF-M6-CRP-00003002



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-SD-00001 THROUGH 24590-WTP-M6-SD-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. THE PRESSURE BOUNDARY FOR ALL SYSTEMS, STRUCTURES, AND COMPONENTS SHOWN ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III UNLESS OTHERWISE NOTED. THE BULGE IS SEISMIC CATEGORY SC-II.
3. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
4. VALVES REQUIRE IMPORTANT TO SAFETY (ITS) AIR FOR EMERGENCY ELUTION.
5. NITROGEN LINES OUTSIDE OF THE BULGE DO NOT HAVE A MINIMUM SLOPE REQUIREMENT.
6. REFER TO 24590-PTF-MKD-CRP-00002 FOR DIFFERENTIAL VOLUME REQUIREMENT BETWEEN LEVEL INSTRUMENTS AND VOLUME REQUIREMENT FOR NITROGEN BLANKET.
7. VALVE CONTAINS BOTH QUALITY LEVEL CV AND QUALITY LEVEL Q. THE LIMIT SWITCHES HAVE A SEISMIC CATEGORY SC-III FUNCTION.
8. LOCKAT CHECK VALVE AS CLOSE TO BULGE AS POSSIBLE.
9. INSTRUMENT IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III.
10. FAIL POSITION FOR THREE WAY VALVES IS SAME AS THE NORMALLY OPEN PATH, AS SHOWN.
11. SEISMIC CATEGORY AND QUALITY LEVEL SHOWN ON THIS DRAWING ARE THE MINIMUM REQUIREMENT. DESIGN, FABRICATION AND INSTALLATION MAY BE TO A HIGHER CLASSIFICATION.
12. PIPELINES CRP-ZF-00003-SHB-02 AND CRP-ZF-00003-SHB-16 INTERSECT AT ELEVATION 637'-0".
13. PIPELINE CRP-ZF-00002-SHB-16 SHALL HAVE A LENGTH OF 8'-8" BETWEEN PIPE CAPS.
14. VALVE HAS A MINIMUM FLOW PORT TO ALLOW VENTING WHILE IN CLOSED POSITION.
15. THIS DRAWING IS CONVERTED FROM SINGLE SHEET TO MULTI-SHEET DRAWING AND IN PART SUPERSEDES 24590-PTF-M6-CRP-00003, REV. 2. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-MKM-CRP-00003, -00004, -00006, AND 24590-PTF-MSM-M601-00037.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATION INTERACT POINTS ARE FULLY DESCRIBED IN THE SOFTWARE FUNCTIONAL SPECIFICATIONS FOR CRP-CESIUM RESIN ADDITION PROCESS SYSTEM, 24590-PTF-SFS-CRP-10001, AND CXP-CESIUM ION EXCHANGE SYSTEM 24590-PTF-SFS-CXP-10001.
2. FOR PERMISSIVES AND INTERLOCKS TO IMPORTANT TO SAFETY (ITS) SYSTEMS, REFER TO ITS SYSTEM REQUIREMENT SPECIFICATION 24590-PTF-SFS-PPH-10004 (FUTURE), -10009 (FUTURE), AND -10013 (FUTURE).

REV	DESCRIPTION	DRC	CHKD/ENVD/APVD	DATE
0	ISSUED FOR CONSTRUCTION SEE NOTE 15			

REVISION HISTORY

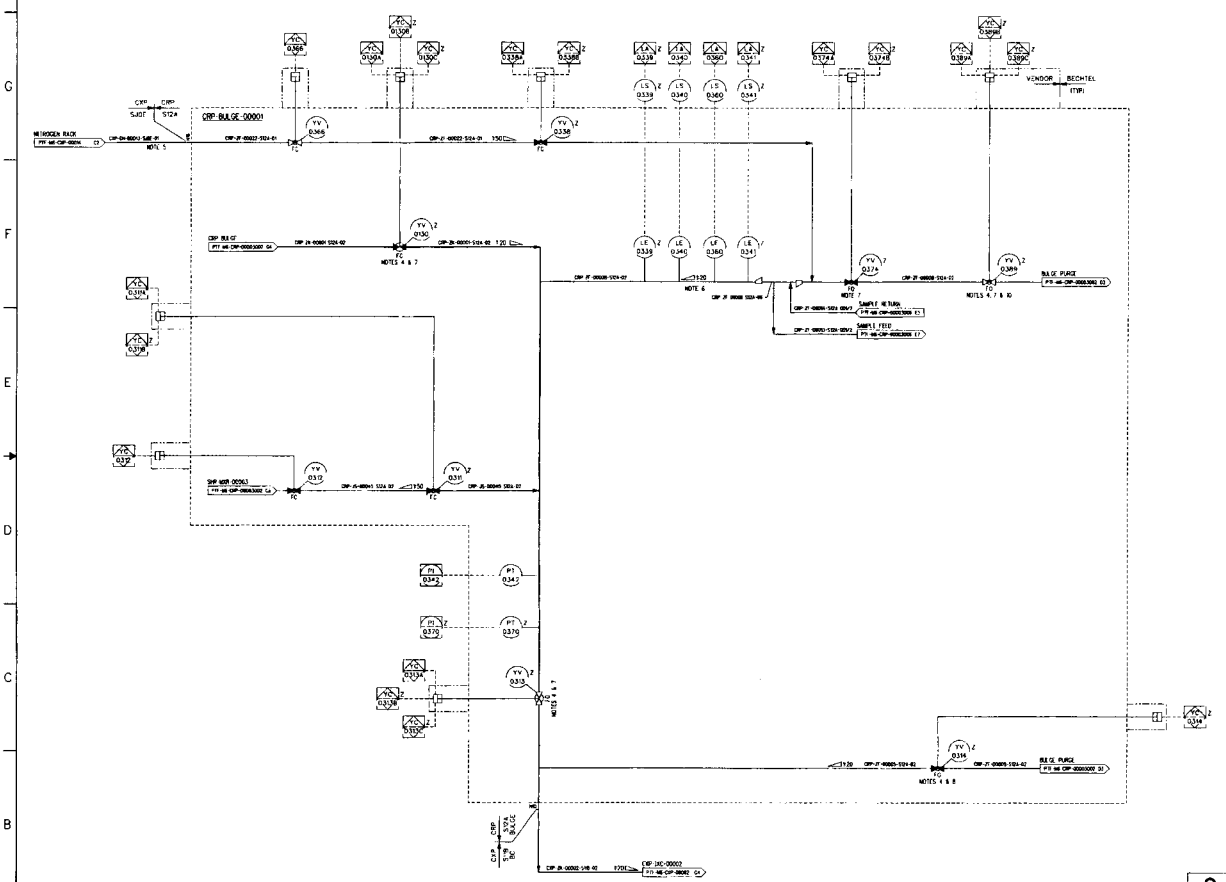
RIVER PROJECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT: DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE HYDROGEN MITIGATION AND FRESH RESIN ADDITION

24590-PTF-M6-CRP-00003002 REV 0

24590-PTF-M6-CRP-00003003



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. THE PRESSURE BOUNDARY FOR ALL SYSTEMS, STRUCTURES, AND COMPONENTS SHOWN ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III UNLESS OTHERWISE NOTED. THE BULGE IS SEISMIC CATEGORY SC-II.
3. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
4. VALVES REQUIRE IMPORTANT TO SAFETY (ITS) AIR FOR EMERGENCY CLOSURE.
5. NITROGEN LINES OUTSIDE OF THE BULGE DO NOT HAVE A MINIMUM SLOPE REQUIREMENT.
6. REFER TO 24590-PTF-MXD-CRP-00002 FOR DIFFERENTIAL VOLUME REQUIREMENT BETWEEN LEVEL INSTRUMENTS AND VOLUME REQUIREMENT FOR NITROGEN BLANKET.
7. VALVE CONTAINS BOTH QUALITY LEVEL CM AND QUALITY LEVEL Q LIMIT SWITCHES. THE LIMIT SWITCHES HAVE A SEISMIC CATEGORY SC-III FUNCTION.
8. INSTRUMENT IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III.
9. SEISMIC CATEGORY AND QUALITY LEVEL SHOWN ON THIS DRAWING ARE THE MINIMUM REQUIREMENT. DESIGN, FABRICATION AND INSTALLATION MAY BE TO A HIGHER CLASSIFICATION.
10. VALVE HAS A MINIMUM FLOW PORT TO ALLOW VENTING WHILE IN CLOSED POSITION.
11. THIS DRAWING IS CONVERTED FROM SINGLE SHEET TO MULTI-SHEET DRAWING AND IN PART SUPERSEDES: 24590-PTF-M6-CRP-00003, REV. 2. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-MRN-CRP-00003, AND 24590-PTF-M6N-M901-00037.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE SOFTWARE FUNCTIONAL SPECIFICATIONS FOR CRP-CESIUM RESIN ADDITION PROCESS SYSTEM, 24590-PTF-SFS-CRP-T0001, AND CRP-CESIUM ION EXCHANGE SYSTEM 24590-PTF-SFS-CXP-T0001.
2. FOR PERMISSIVES AND INTERLOCKS TO IMPORTANT TO SAFETY (ITS) SYSTEMS, REFER TO SAFETY SYSTEM REQUIREMENT SPECIFICATION 24590-PTF-SYS-RPJ-T0004 (FUTURE), -T0009 (FUTURE), AND -T0013 (FUTURE).

Q	0	ISSUED FOR CONSTRUCTION SEE NOTE 9			
	REV	DESCRIPTION	DRG	CHK/DY	APVD DATE

REVISION HISTORY

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No DE-AC27-01RV14136

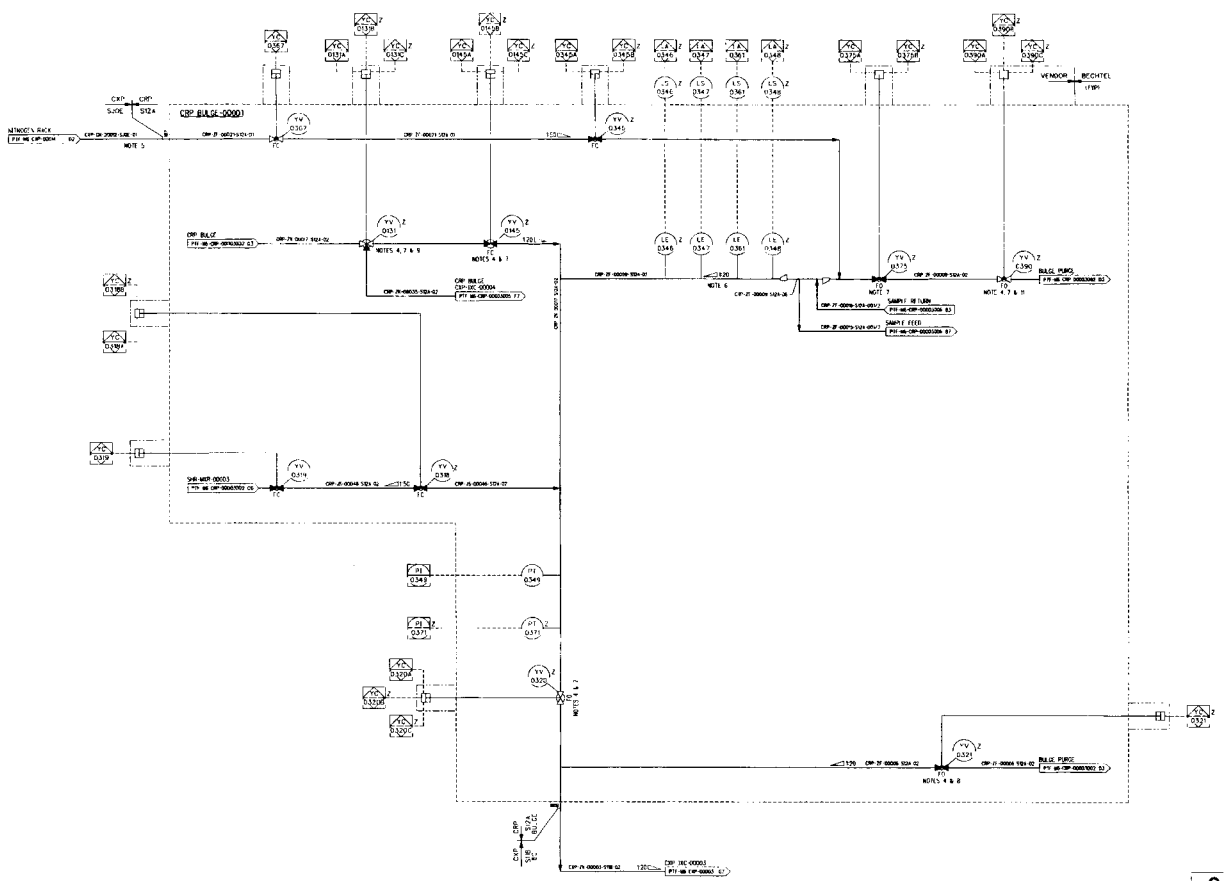
P&ID - PTF
CESIUM ION EXCHANGE HYDROGEN MITIGATION AND FRESH RESIN ADDITION

SCALE NONE

24590-PTF-M6-CRP-00003003

REV 0

24590-PTF-M6-CRP-00003004



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. THE PRESSURE BOUNDARY FOR ALL SYSTEMS, STRUCTURES, AND COMPONENTS SHOWN ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED. THE BULGE IS SEISMIC CATEGORY SC-II.
3. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
4. VALVES REQUIRE IMPORTANT TO SAFETY (ITS) AIR FOR EMERGENCY ELUTION.
5. NITROGEN LINES OUTSIDE OF THE BULGEGO NOT HAVE A MINIMUM SLOPE REQUIREMENT.
6. REFER TO 24590-PTF-MXD-CRP-00007 FOR DIFFERENTIAL VOLUME REQUIREMENT BETWEEN LEVEL INSTRUMENTS AND VOLUME REQUIREMENT FOR NITROGEN BLANKET.
7. VALVE CONTAINS BOTH QUALITY LEVEL ON AND QUALITY LEVEL Q LIMIT SWITCHES. THE LIMIT SWITCHES HAVE A SEISMIC CATEGORY SC-III FUNCTION.
8. INSTRUMENT IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III.
9. FAIL POSITION FOR THREE WAY VALVES IS SAME AS THE NORMALLY OPEN PATH, AS SHOWN.
10. SEISMIC CATEGORY AND QUALITY LEVEL SHOWN ON THIS DRAWING ARE THE MINIMUM REQUIREMENT. DESIGN, FABRICATION AND INSTALLATION MAY BE TO A HIGHER CLASSIFICATION.
11. VALVE CONTAINS A MINIMUM FLOW PORT TO ALLOW VENTING WHILE IN CLOSED POSITION.
12. THIS DRAWING IS CONVERTED FROM SINGLE SHEET TO MULTI SHEET DRAWING AND IN PART SUPERSEDES 24590-PTF-M6-CRP-00003, REV. 2. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-MXD-FLP-00003 AND 24590-PTF-MXD-MMT-00037

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE SOFTWARE FUNCTIONAL SPECIFICATIONS FOR CRP CESIUM RESIN ADDITION PROCESS SYSTEM, 24590-PTF-SPS-LRP-T0001 AND LAP-CESIUM ION EXCHANGE SYSTEM 24590-PTF-SPS-CXP-T0001
2. FOR PERMISSIVES AND INTERLOCKS TO IMPORTANT TO SAFETY (ITS) SYSTEMS, REFER TO SAFETY SYSTEM REQUIREMENT SPECIFICATION 24590-PTF-SPS-RPS-T0014 (INTERIM), T0009 (FUTURE), AND T0013 (FUTURE)

REV	DESCRIPTION	DRC	CHKD	RVWD	APVD	DATE
0	ISSUED FOR CONSTRUCTION SEE NOTE 12					

REVISION HISTORY

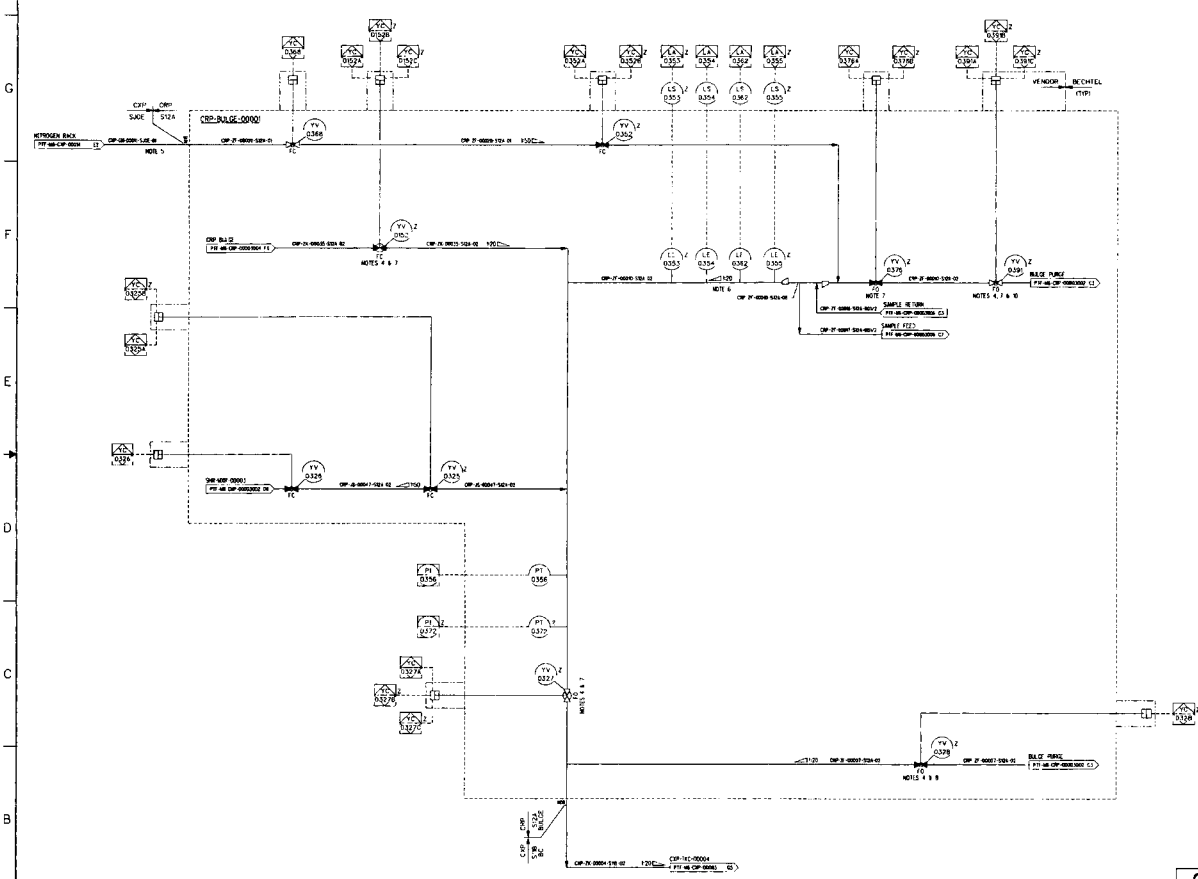
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE HYDROGEN MITIGATION AND FRESH RESIN ADDITION

24590-PTF-M6-CRP-00003004 REV 0

24590-PTF-M6-CRP-00003005



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00006 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. THE PRESSURE BOUNDARY FOR ALL SYSTEMS, STRUCTURES, AND COMPONENTS SHOWN ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III UNLESS OTHERWISE NOTED. THE BULGE IS SEISMIC CATEGORY SC-II.
3. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
4. VALVES REQUIRE IMPORTANT TO SAFETY (ITS) AIR FOR EMERGENCY ELUTION.
5. NITROGEN LINES OUTSIDE OF BULGE DO NOT HAVE A MINIMUM SLOPE REQUIREMENT.
6. REFER TO 24590-PTF-MKO-CRP-00003 FOR DIFFERENTIAL VOLUME REQUIREMENT BETWEEN LEVEL INSTRUMENTS AND VOLUME REQUIREMENT FOR NITROGEN BLANKET.
7. VALVE CONTAINS BOTH QUALITY LEVEL CM AND QUALITY LEVEL Q LIMIT SWITCHES. THE LIMIT SWITCHES HAVE A SEISMIC CATEGORY SC-III FUNCTION.
8. INSTRUMENT IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III.
9. SEISMIC CATEGORY AND QUALITY LEVEL SHOWN ON THIS DRAWING ARE THE MINIMUM REQUIREMENT. DESIGN, FABRICATION, AND INSTALLATION MAY BE TO A HIGHER CLASSIFICATION.
10. VALVE CONTAINS A MINIMUM FLOW PORT TO ALLOW VENTING WHILE IN CLOSED POSITION.
11. THIS DRAWING IS CONVERTED FROM SINGLE SHEET TO MULTI-SHEET DRAWING AND IN PART SUPERSEDES 24590-PTF-M6-CRP-00003, REV. 2. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-CRP-00003, AND 24590-PTF-M6N-M001-00037.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE SOFTWARE FUNCTIONAL SPECIFICATIONS FOR CRP-CESIUM RESIN ADDITION PROCESS SYSTEM 24590-PTF-SFS-CXP-T0001 AND CXP-CESIUM ION EXCHANGE SYSTEM 24590-PTF-SFS-CXP-T0001.
2. FOR PERMISSIVES AND INTERLOCKS TO IMPORTANT TO SAFETY (ITS) SYSTEMS REFER TO SAFETY SYSTEM REQUIREMENT SPECIFICATION 24590-PTF-SFS-RPJ-T0004 (FUTURE), T0009 (FUTURE), AND T0013 (FUTURE).

REV.	DESCRIPTION	DRN	CHKD	IN/INSPECT	DATE
0	ISSUED FOR CONSTRUCTION SET NOTE 1				

REVISION HISTORY

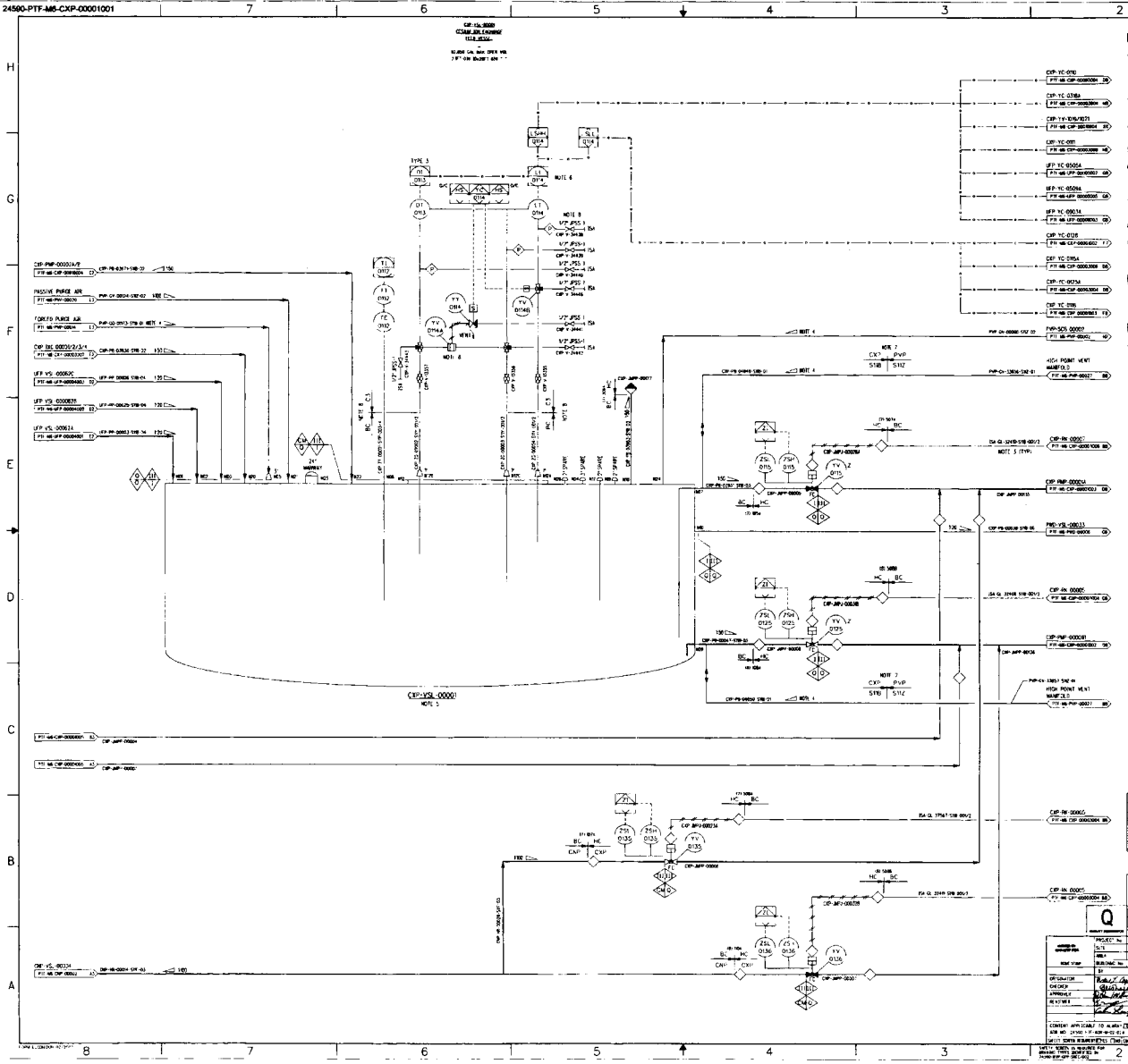
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE
HYDROGEN MITIGATION AND
FRESH RESIN ADDITION

24590-PTF-M6-CRP-00003005 | REV. 0

24590-PTF-M6-CXP-00001001



NOTES:

1. REF DRAWINGS 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SCOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED. ISA SUPPLY AIR TO VALVES ON JUMPERS IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF DRAINING, UNLESS OTHERWISE NOTED.
5. FOR VESSEL WASH RING CONNECTION, SEE DRAWING 24590-PTF-M6-CXP-00002.
6. HIGH/HIGH LEVEL TRIP CLOSES VALVES CXP-YV-0318, -0319, -0321, -0312, -0311, MOVES CXP-YV-0314 TO PATH B, AND STOPS REVERSE FLOW DIVERTERS UFP-RP-0-00013, -00038, AND -00044. LOW LOW LEVEL TRIP CLOSES VALVES CXP-YV-0315 AND -0125, SHUTS DOWN PUMPS CXP-PMP-00001A OR -00001B.
7. MINIMIZE LENGTH OF VENT PIPE FROM VESSEL OUTLET LINE TO ISOLATION VALVE. AT PVP HIGH POINT VENT MANIFOLD SYSTEM, PIPE GLASS BREAK IS AT OR ABOVE VESSEL OVERFLOW ELEVATION.
8. SEE DRAWING 24590-PTF-M6-15A-00009 FOR BUBBLER RACKS AND SYSTEM CONNECTIONS.
9. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI SHEET DRAWINGS, AND, IN PART, SUPERSEDES 24590-PTF-M6-CXP-00001REV 4.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PLUMBISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INPUT/OUTPUT POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE REVISIONS)

DRAWING INDEX

DWG NO.	TITLE
24590-PTF-M6-CXP-00001001	CESIUM ION EXCHANGE, CXP-VSL-00001
24590-PTF-M6-CXP-00001002	CESIUM ION EXCHANGE, CXP-PMP-00001A
24590-PTF-M6-CXP-00001003	CESIUM ION EXCHANGE, CXP-PMP-00001B
24590-PTF-M6-CXP-00001004	CESIUM ION EXCHANGE, CXP-VSL-00001A
24590-PTF-M6-CXP-00001005	CESIUM ION EXCHANGE, CXP-VSL-00001B

REV	DESCRIPTION	DRN	CHKD	REVIEW	APVD	DATE
0	ISSUED FOR CONSTRUCTION (SEE NOTE 9)					

REVISION HISTORY

Q

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

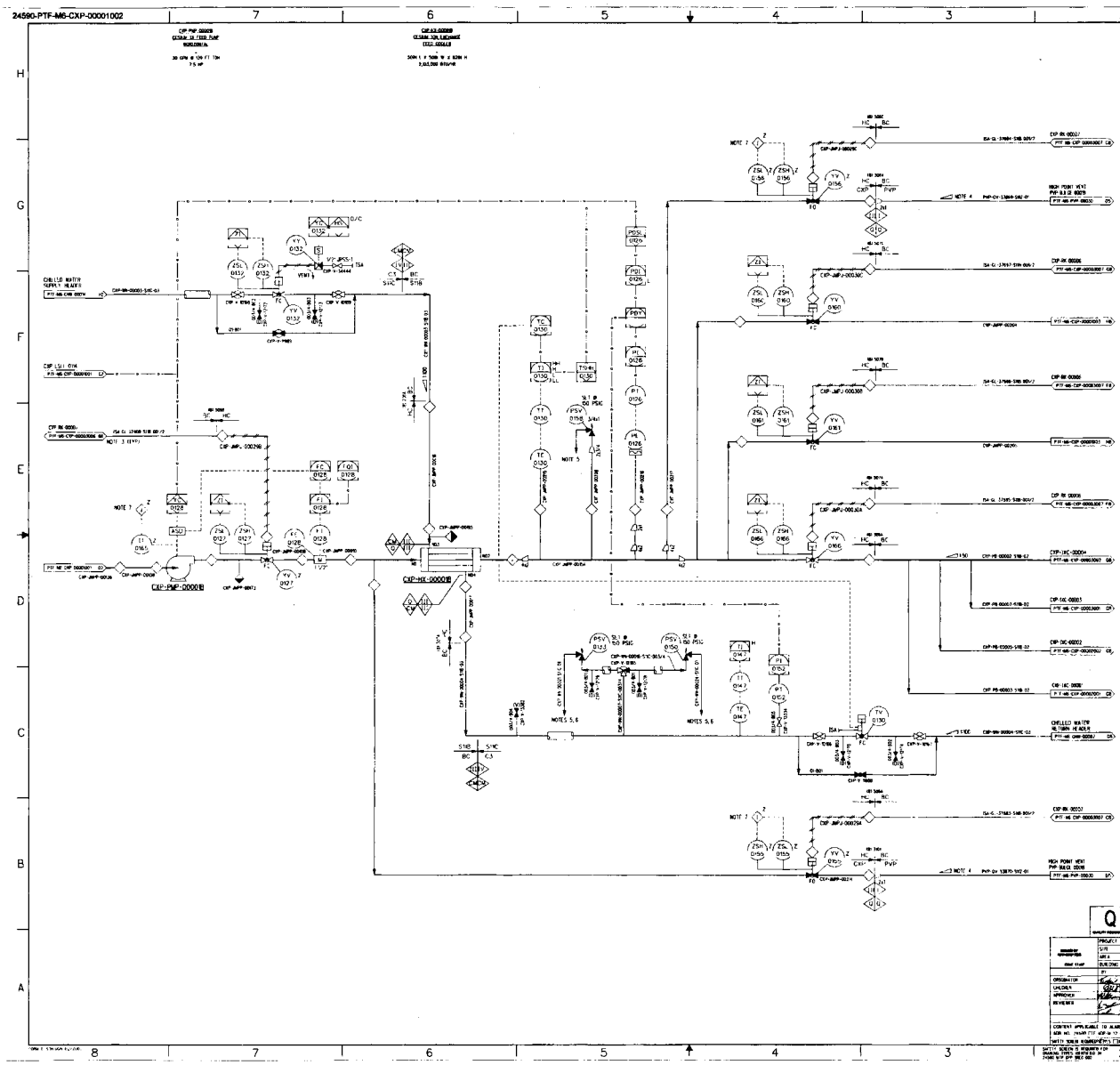
P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM CXP-VSL-00001

SCALE NONE

24590-PTF-M6-CXP-00001001

REV 0

24590-PTF-M6-CXP-00001002



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC III, UNLESS OTHERWISE NOTED. ISA SUPPLY AIR TO VALVES ON JUMPERS IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF DRAINING, UNLESS OTHERWISE NOTED.
5. DIRECT PRESSURE RELIEF VALVE (PSV) DISCHARGE LINE DOWNWARD TO MINIMIZE POTENTIAL SPRAY TO SURROUNDING AREA.
6. ROUTE PRESSURE RELIEF VALVE (PSV) DISCHARGE LINES TO THE NEAREST C/S DRAIN.
7. PUMP/VALVE INTERLOCK LOGIC UNDER DEVELOPMENT. DETAILS TO BE SHOWN ON FUTURE REVISION OF THIS DRAWING.
8. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI SHEET DRAWINGS AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00001 REV. 4.

HOLD/OPEN ITEM:

NONE

REFERENCES:

1. THE REQUIRED HATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE REVISION).

REV	DESCRIPTION	ORG	CHKD	REVWD	APVD	DATE
1	ISSUED FOR CONSTRUCTION SEE NOTE 8					

REVISION HISTORY

REVISE PROTECTION PROJECT
WASTE TREATMENT PLANT
2430 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No DE-AC27-01RV14136

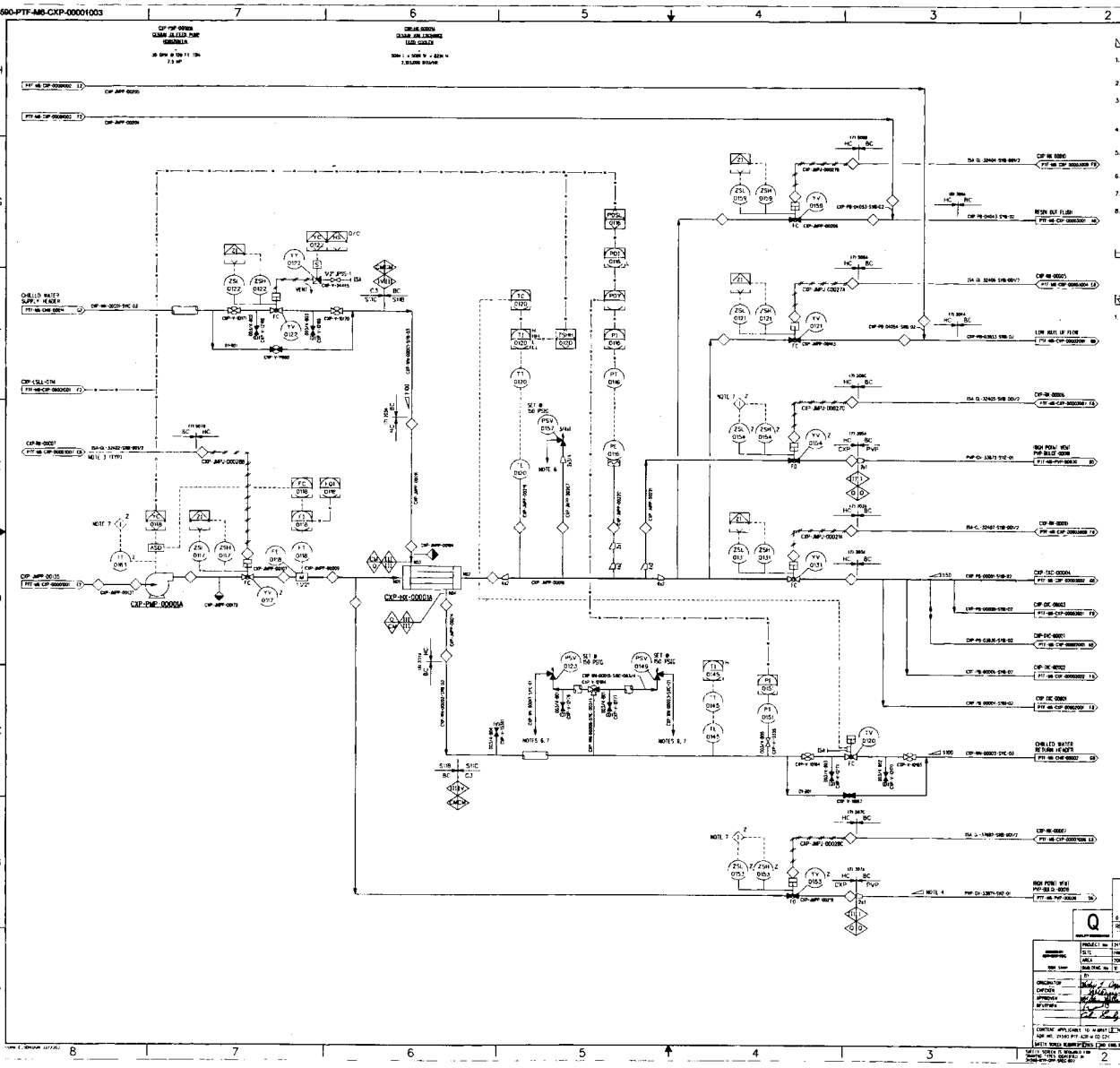
P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM
CXP-PMP-00001B

SCALE NONE

24590-PTF-M6-CXP-00001002

REV 0

24590-PTF-M6-CXP-00001003



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED. ISA SUPPLY AIR TO VALVES ON JUMPERS IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK COLL LINES WHICH ARE SELF-DRAINING, UNLESS OTHERWISE NOTED
5. DIRECT PRESSURE RELIEF VALVE (PSV) DISCHARGE LINE DOWNWARD TO MINIMIZE POTENTIAL SPRAY TO SURROUNDING AREA
6. ROUTE PRESSURE RELIEF VALVE (PSV) DISCHARGE LINES TO THE NEAREST C3 DRAIN.
7. PUMP/VALVE INTERLOCK LOGIC UNDER DEVELOPMENT DETAILS TO BE SHOWN ON FUTURE REVISION OF THIS DRAWING
8. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00001 REV 4.

HOLD/OPEN ITEM:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE REVISION)

REV	DESCRIPTION	ORG	CHKD	REVIEWED	DATE
0	ISSUED FOR CONSTRUCTION SEE NOTE 8				

REVISION HISTORY

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No DE-AC27-01RV14136

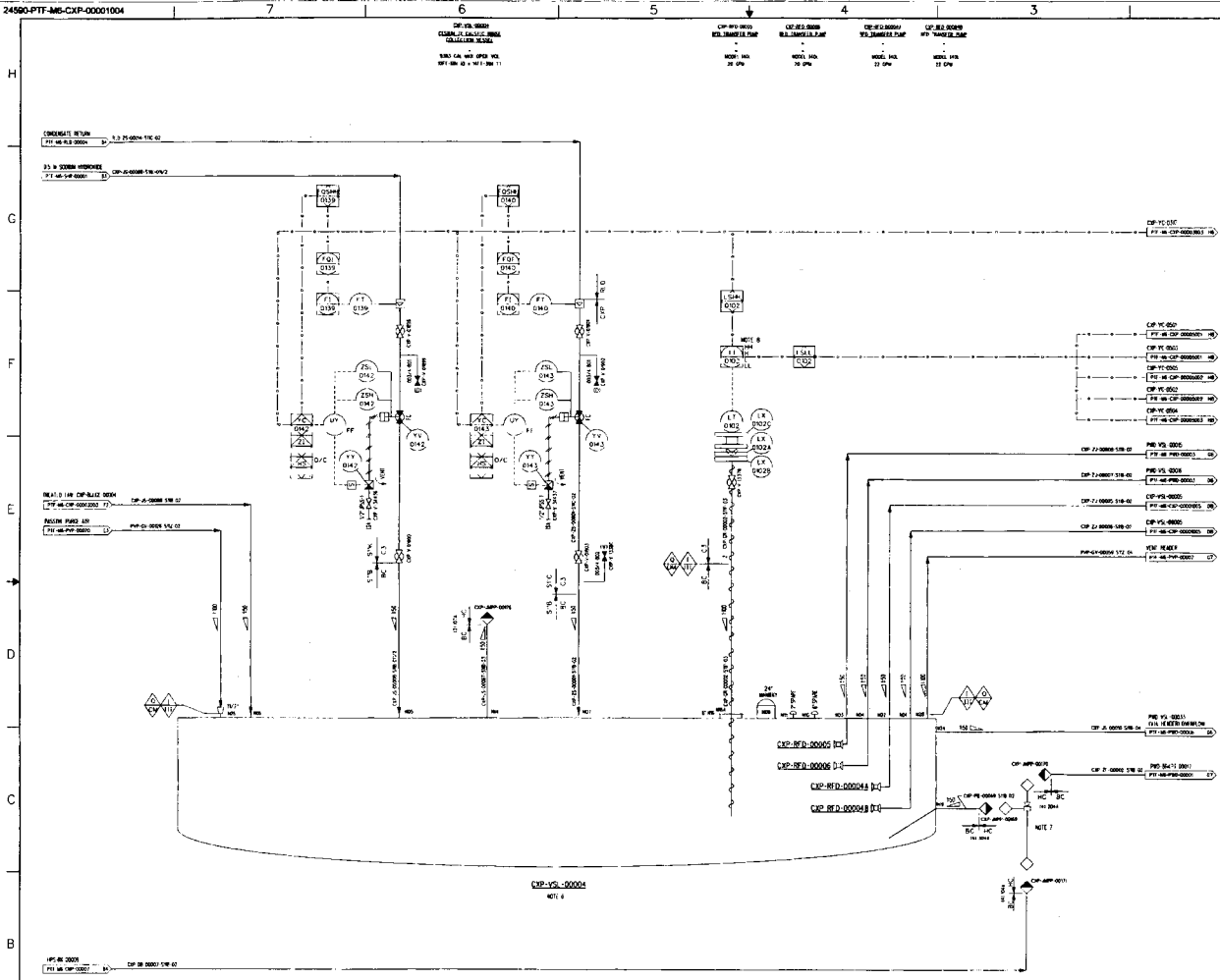
P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM CXP-PMP-00001A

SCALE NONE

24590-PTF-M6-CXP-00001003

REV 0

24590-PTF-M6-CXP-00001004



NOTES:

1. SEE DRAWINGS 2459-PTF-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SCOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL QM AND SEISMIC CATEGORY SC-I/I, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, UNLESS OTHERWISE NOTED.
5. FOR REVERSE FLOW DIVERTER/PULSE JET MIXER FLUIDIC DRIVE REPRESENTATION, REFER TO DRAWING 24590-PTF-M6-CXP-00005004.
6. FOR VESSEL WASH RING CONNECTION, SEE DRAWING 24590-PTF-M6-CXP-00007.
7. ONE OF THE TRANSFERABLE EJECTORS UFV-EJCTR-00013, UFP-EJCTR-00073, OR UFP-EJCTR-00094 WITH ITS ASSOCIATED JUMPERS WILL BE TEMPORARILY INSTALLED AT A FIELD. THE BLIND JUMPERS CXP-JMPP-00069, CXP-JMPP-00170 AND CXP-JMPP-00171 ARE NORMALLY INSTALLED.
8. HIGH-HIGH LEVEL TRIP CLOSES VALVES CXP-YV-0142, -0143, AND -0147. LOW-LOW LEVEL TRIP STOPS REVERSE FLOW DIVERTERS CXP-RFD-00004A, -00004B, -00005, AND -00006.
9. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND, IN PART, SUPERSEDES 24590-PTF-M6-CXP-00001 REV 4. THIS DRAWING MAY INCLUDE INFORMATION FROM 24590-PTF-MEH-10-00002.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PLANT/SYSTEM INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS, HIT-PURE AND THE CXP SYSTEM DESCRIPTION (FUTURE REVISION).

REV	DESCRIPTION	DRG	CHKD	RVWD	APVD	DATE
0	ISSUED FOR CONSTRUCTION (w/ NOTE 9)					

REVISION HISTORY

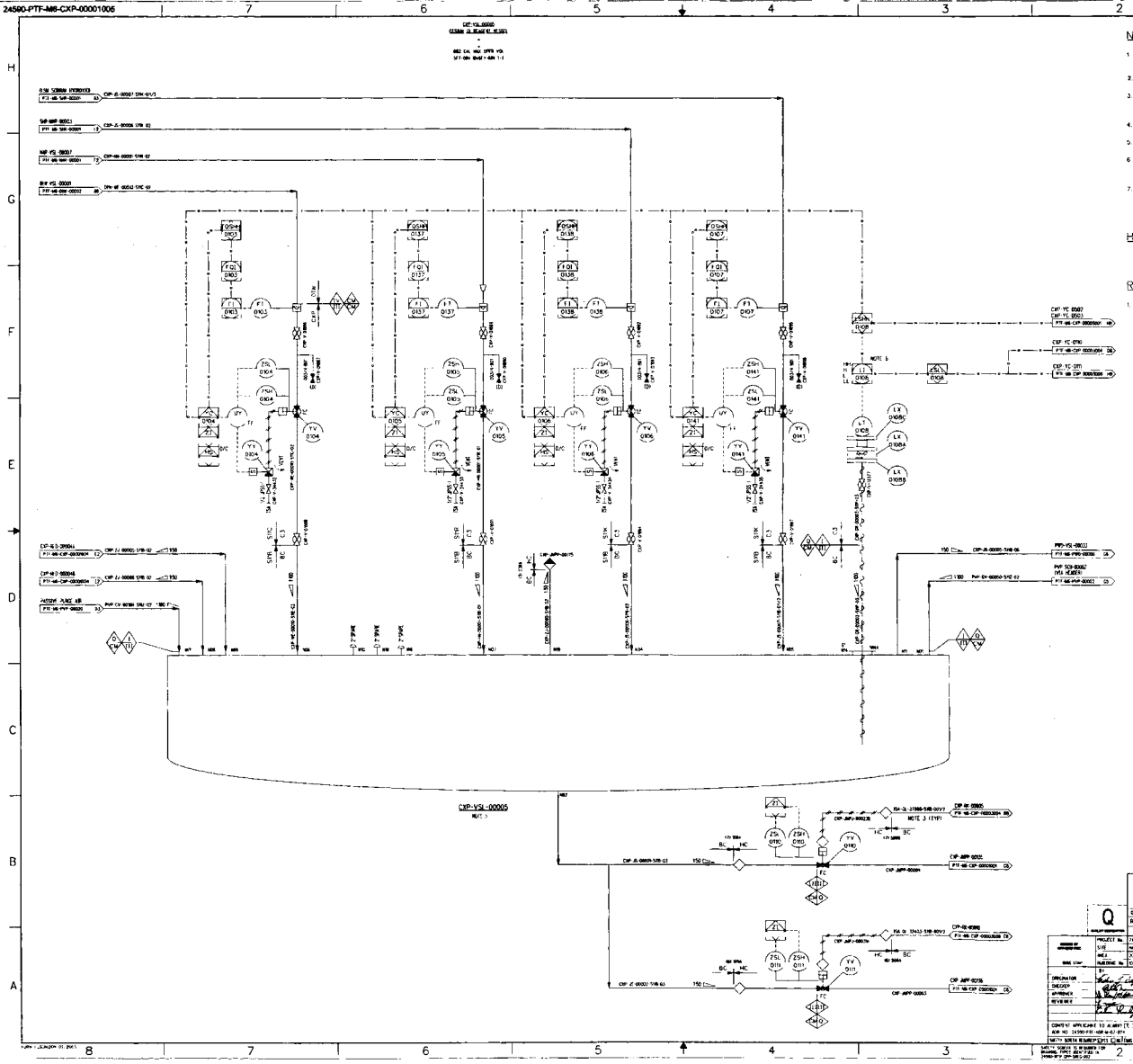
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM
CXP-VSL-00004

24590-PTF-M6-CXP-00001004 — REV 0

24590-PTF-M6-CXP-00001006



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL CW AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED. (SA SUPPLY AIR TO VALVES ON JUMPERS IS QUALITY LEVEL CW AND SEISMIC CATEGORY SC-III).
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, UNLESS OTHERWISE NOTED.
5. FOR VESSEL WASH RING CONNECTION, SEE DRAWING 24590-PTF-M6-CXP-00007.
6. HIGH-HIGH LEVEL TRIP CLOSES CXP-YV-0104, -0105, -0106, 0141 AND STOPS REVERSE FLOW DIVERTERS CXP-RFD-0000A4, AND CXP-RFD-000046 ON DRAWING 24590-PTF-M6-CXP-00006004 LOW-LOW LEVEL TRIP CLOSES CXP-YV 0110 AND -0111.
7. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI SHEET DRAWINGS, AND IN PART, SUPERSEDES 24590-PTF-M6-CXP-00001 REV 4. THIS DRAWING MAY INCLUDE INFORMATION FROM 24590-PTF-M6N-10-00002.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FIGURE 1 AND THE CXP SYSTEM DESCRIPTION (FUTURE REVISION).

REV	DESCRIPTION	ORG	CHKD	NVRDAPV3	DATE
0	ISSUED FOR CONSTRUCTION SET NOTE 7				7/24/02

REVISION HISTORY

PROJECT No. 24590
SITE HANFORD
AREA XXX
BUILDING No. 00

WASHINGTON GROUP INTERNATIONAL

WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

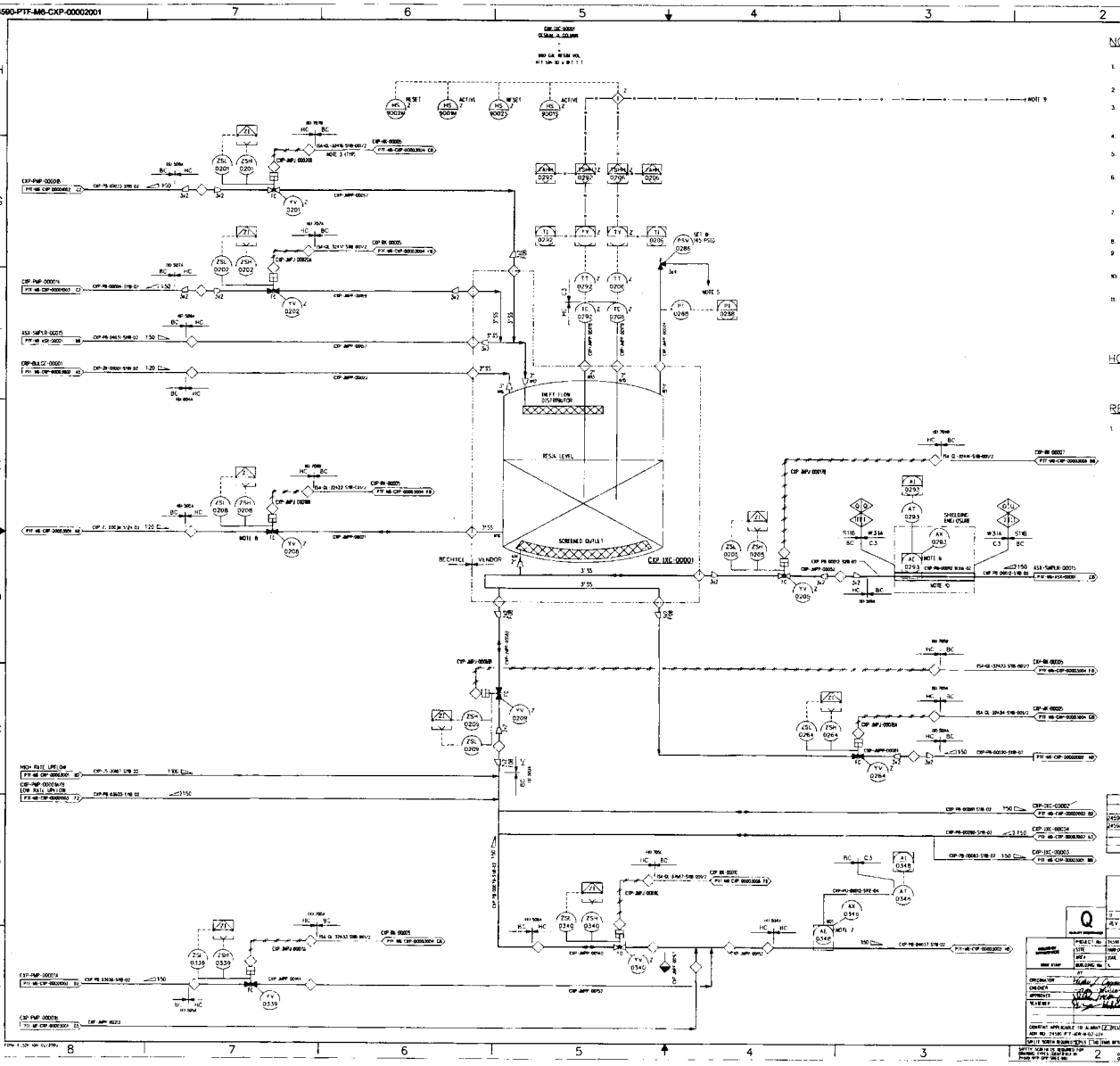
CONTRACT No. DE-AC27-01RV14136

ORIGINATOR
CHECKED
APPROVED
REVIEWED

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM
CXP-VSL-00005

24590-PTF-M6-CXP-00001005 REV 0

24590-PTF-M6-CXP-00002001



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-N0-00001 THROUGH 24590-WTP-M6-N0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-II; ISA SUPPLY AIR TO VALVES ON JUMPERS IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III UNLESS OTHERWISE NOTED.
4. THIS DRAWING SHOWS CXP-IXC-00001 IN THE LEAD POSITION. BOLDED LINES INDICATE FLOW.
5. DIRECT PRESSURE RELIEF VALVE (PSV) DISCHARGE LINE DOWNWARD TO MINIMIZE POTENTIAL SPRAY TO SURROUNDING AREA.
6. CESIUM-137 ANALYZER DETECTS RADIATION VIA A DRY WELL WHICH IS INSTALLED INTERNAL TO THE SHIELDED ENCLOSURE. THE ENCLOSURE QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III. THE SHIELDED ENCLOSURE IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-II.
7. FOUR INCH SCHEDULE 40S 316L PIPE IS TO BE USED AS A GUIDE TUBE TO FACILITATE INSTALLATION AND REMOVAL OF RADIATION INSTRUMENTS. PIPE INF AND CESIUM-137 ANALYZER WILL BE QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III.
8. VALVE IS LOW POINT IN RESIN REMOVAL ROUTE.
9. HIGH HIGH TEMPERATURE (CXP-TSHH-0208 OR 0292) INITIATES EMERGENCY FLUTION. DETAILS ARE CONTAINED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE).
10. THE OUTER PIPE OF THE COAXIAL LINE SHOULD PROVIDE A MINIMUM OF 2 INCHES INTO THE BLACK CELL FOR LEAK DETECTION PURPOSES.
11. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00002 REV. 4. DELETED AI-0329 AND AI-0294. ADDED COAXIAL PIPE AND REVISED QUALITY LEVEL AND SEISMIC CATEGORY DESIGNATION. REMOVED HOLDS. ADDED FULL DETAILED INSTRUMENTATION.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE REVISION).

DRAWING INDEX		
DWG NO	TITLE	
24590-WTP-M6-CXP-00002001	CXP SYSTEM COLUMN	CXP-IXC-00001
24590-PTF-M6-CXP-00002001	CXP SYSTEM COLUMN	CXP-IXC-00001

REVISION HISTORY				
REV	DESCRIPTION	DRC/CHKD	REVIEWED	DATE
0	ISSUED FOR CONSTRUCTION (SEE NOTE 1)			

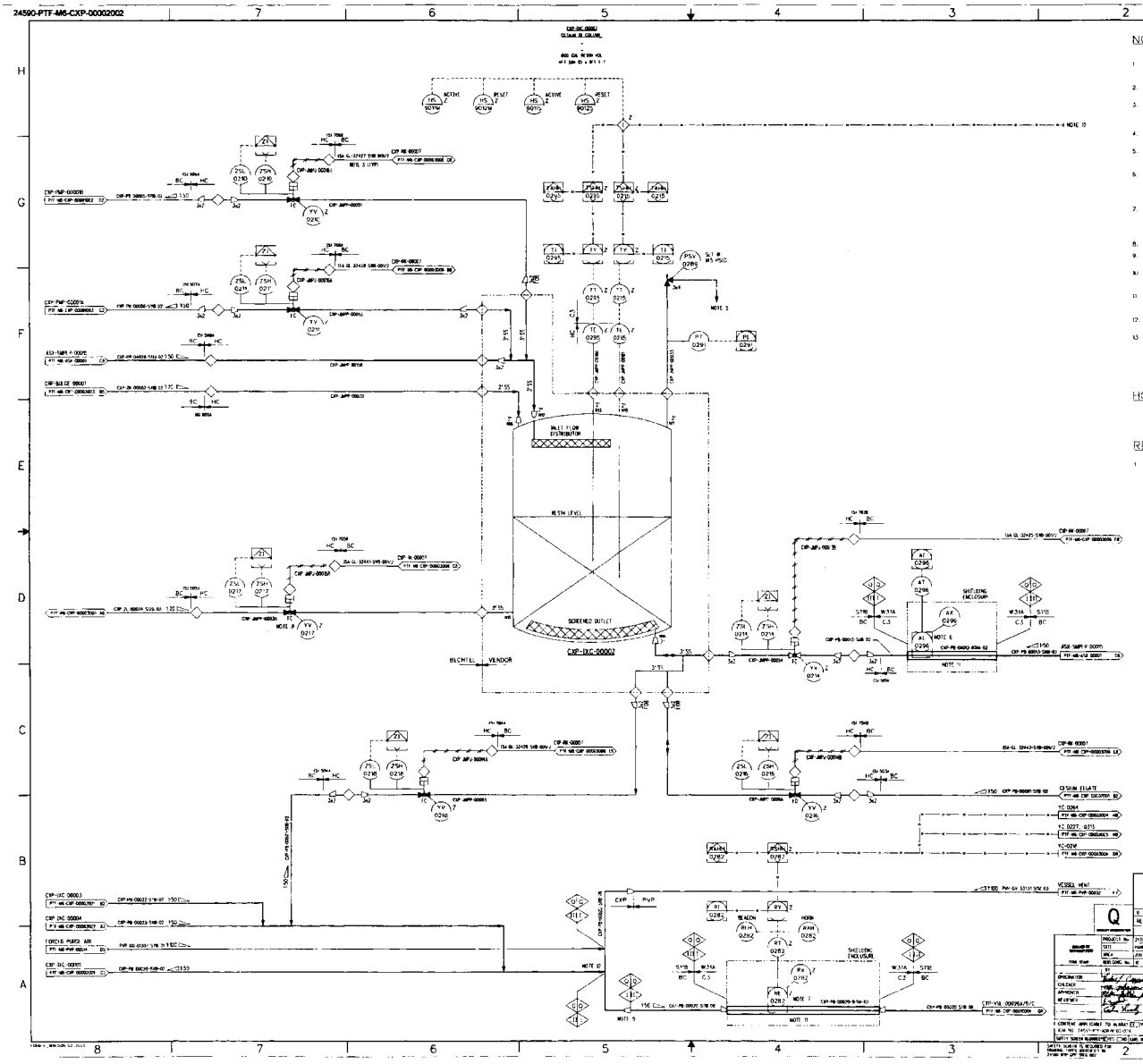
Q

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No DE-AC27-01RL14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM COLUMN
CXP-IXC-00001

SCALE: NONE
24590-PTF-M6-CXP-00002001
REV 0



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC III. TSA SUPPLY AIR TO VALVES ON JUMPERS IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC III UNLESS OTHERWISE NOTED.
4. THIS DRAWING SHOWS CXP-IXC-00002 IN THE LAG POSITION. BOLDED LINES INDICATE FLOW.
5. DIRECT PRESSURE RELIEF VALVE (PSV) DISCHARGE LINE DOWNWARD TO MINIMIZE POTENTIAL SPRAY TO SURROUNDING AREA.
6. CESIUM 137 ANALYZER DETECTS RADIATION VIA A DRY WELL WHICH IS INSTALLED INTERNAL TO THE SHIELDED ENCLOSURE. THE WELL PIPE IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC III. THE SHIELDING ENCLOSURE IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC III.
7. RADIATION ALARM RA-0282 IS LOCATED IN A DRY WELL WHICH IS INSTALLED INTERNAL TO THE SHIELDED ENCLOSURE. SEGMENT FOR RE MUST BE FULL DURING NORMAL OPERATION FOR ACCURATE MEASUREMENT. RE INSTRUMENT IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC III.
8. VALVE IS LOW POINT IN RESIN REMOVAL ROUTE.
9. BOTTOM REDUCER OF SIPHON BREAK TO BE AT LEAST 15 INCHES BELOW SIPHON BREAK INLET.
10. HIGH HIGH TEMPERATURE (CXP-TSHH-0215 OR 0295) INITIATES EMERGENCY FLUSHING. DETAILS ARE CONTAINED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE).
11. THE OUTER PIPE OF THE COAXIAL LINE SHOULD PROTRUDE A MINIMUM OF 4 INCHES INTO THE BLACK CELL FOR LEAK DETECTION PURPOSES.
12. PIPELINE CXP-PB-00020-S1B 02 SHALL INTERSECT PIPELINE CXP-PB-00020-S1B-06 AT AN ELEVATION NO LESS THAN 85'-0".
13. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI SHEET DRAWINGS. AND/OR PART SUBHEADER. CHANGED PIPE CXP-00003 (REV. 4, DELETED 48-0291, ADDED COAXIAL PIPE CXP-00003 (REV. 4, DELETED 48-0291, ADDED CATEGORY DESIGNATION, REMOVED HOLDS, ADDED FULL DETAILED INSTRUMENTATION.

HOLD/OPEN ITEMS:

NONE.

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE REVISION).

REV	DESCRIPTION	ORG	CHKD	REVIEW	APVD	DATE
0	ISSUED FOR CONSTRUCTION SEE NOTE 13	VLC	[illegible]	[illegible]	[illegible]	2/16/04

REVISION HISTORY

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT NO. DE-AC27-01RV14136

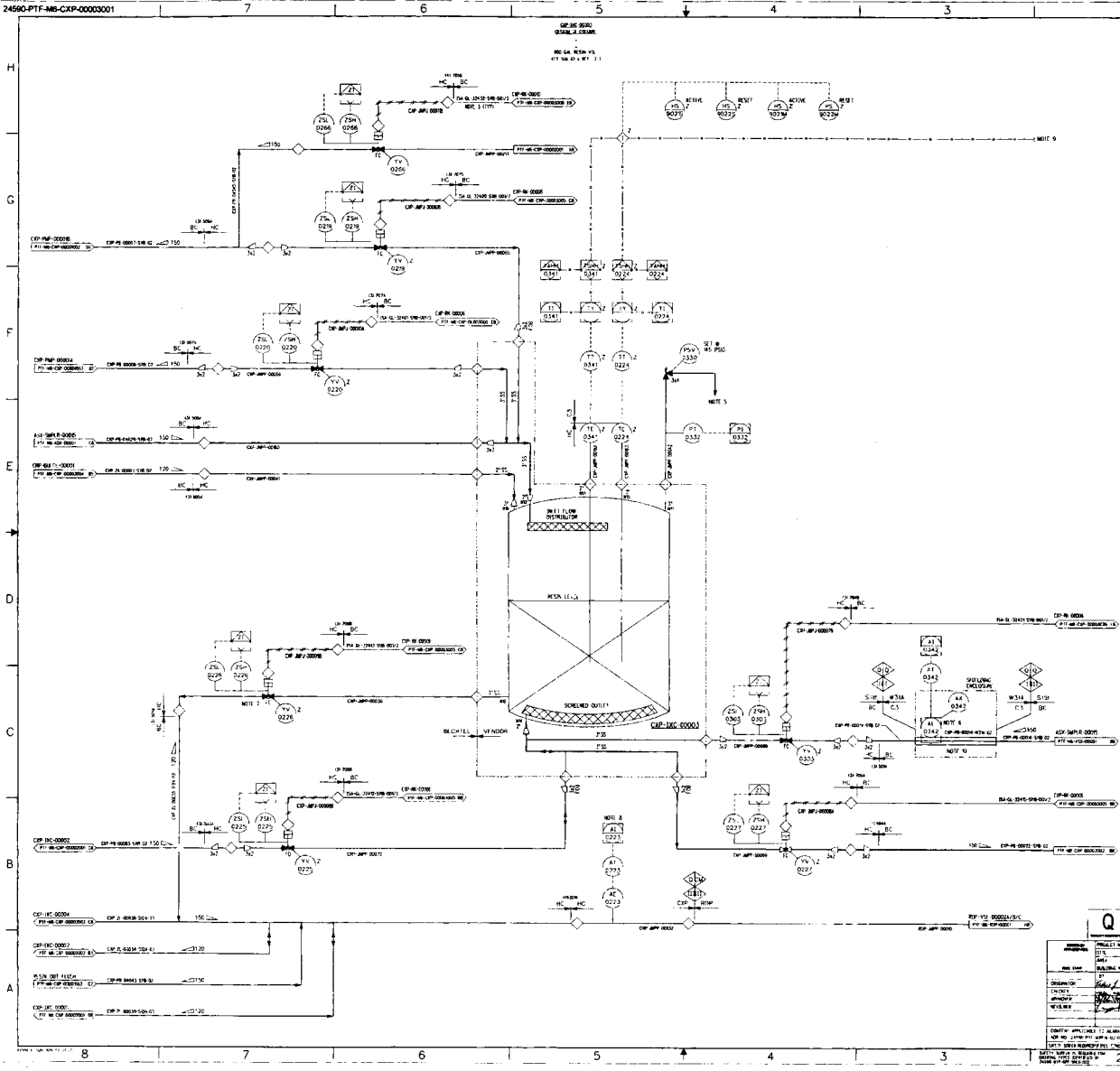
P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM COLUMN
CXP-IXC-00002

SCALE: NONE

24590-PTF-M6-CXP-00002002

REV 0

24590-PTF-M6-CXP-00003001



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL D AND SEISMIC CATEGORY SC-III. ISA SUPPLY AIR TO VALVES ON JUMPERS IS QUALITY LEVEL CW AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. THIS DRAWING SHOWS CXP-IXC-00003 IN THE POLISHING POSITION. BOLDED LINES INDICATE FLOW.
5. DIRECT PRESSURE RELIEF VALVE (PSV) DISCHARGE LINE DOWNWARD TO MINIMIZE POTENTIAL SPRAY TO SURROUNDING AREA.
6. CESIUM-137 ANALYZER DETECTS RADIATION VIA A DRY WELL WHICH IS INSTALLED INTEGRAL TO THE SHIELDED ENCLOSURE. THE ANALYZER IS QUALITY LEVEL CW AND SEISMIC CATEGORY SC-III. THE SHIELDING ENCLOSURE IS QUALITY LEVEL D AND SEISMIC CATEGORY SC-III.
7. VALVE IS LOW POINT IN RESIN REMOVAL ROUTE.
8. ANALYZER IS FOR SOLIDS MONITORING.
9. HIGH-HIGH TEMPERATURE (CXP-TSHH-0224 OR 0341) INITIATES EMERGENCY FLUSH. DETAILS ARE CONTAINED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE).
10. THE OUTER PIPE OF THE COAXIAL LINE SHOULD PROTRUDE A MINIMUM OF 1 INCHES INTO THE BLACK CELL FOR LEAK DETECTION PURPOSES.
11. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS. AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00001 REV. 4. DELETED AL-0343. ADDED COAXIAL PIPE AND REVISED QUALITY LEVEL AND SEISMIC CATEGORY DESIGNATION. REMOVED HOLDS. ADDED FULL DETAILED INSTRUMENTATION.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE REVISION).

DRAWING INDEX

DWG NO	TITLE
24590-PTF-M6-CXP-00003001	CXP SYSTEM COLUMNS CXP-IXC-00003
24590-PTF-M6-CXP-00003002	CXP SYSTEM COLUMNS CXP-IXC-00004
24590-PTF-M6-CXP-00003003	CXP SYSTEM BLACK CXP-BLACK 00004
24590-PTF-M6-CXP-00003004	CXP SYSTEM INST RACK CXP-RK-00005
24590-PTF-M6-CXP-00003005	CXP SYSTEM INST RACK CXP-RK-00006
24590-PTF-M6-CXP-00003006	CXP SYSTEM INST RACK CXP-RK-00007
24590-PTF-M6-CXP-00003007	CXP SYSTEM INST RACK CXP-RK-00004/07
24590-PTF-M6-CXP-00003008	CXP SYSTEM INST RACK CXP-RK-00003
24590-PTF-M6-CXP-00003009	CXP SYS. INST CXP-RK-00005/06/07/10 (SPARES)

REVISION HISTORY

REV	DESCRIPTION	DRN	CHKD	REV	APVD	DATE
0	ISSUED FOR CONSTRUCTION SEE NOTE 11					2/17/06

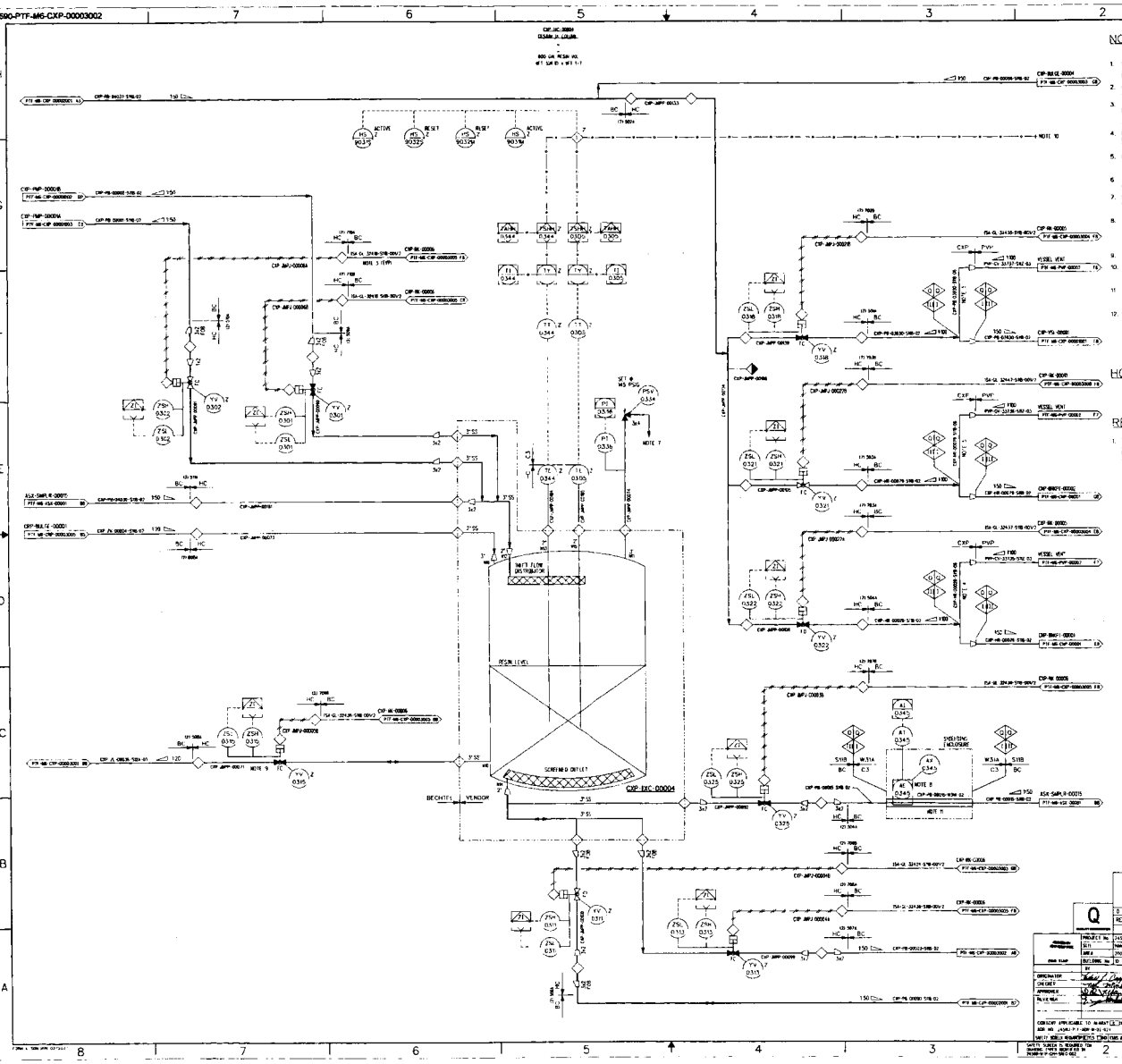
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER P. ACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM COLUMNS CXP-IXC-00003

SCALE: NONE
24590-PTF-M6-CXP-00003001
REV. 0

24590-PTF-M6-CXP-00003002



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III (SA SUPPLY AIR TO VALVES ON JUMPERS IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED).
4. PIPELINES WILL INTERSECT AT ELEVATION 47'-0" BOTTOM REDUCER OF SIPHON BREAK TO BE AT LEAST 20 INCHES BELOW SIPHON BREAK INLET.
5. PIPELINES WILL INTERSECT AT AN ELEVATION NO LESS THAN 85'-0" BOTTOM REDUCER OF SIPHON BREAK TO BE AT LEAST 20 INCHES BELOW SIPHON BREAK INLET.
6. THIS DRAWING SHOWS CXP-IXC-00004 BEING DOWN FLOW ELUTED. BOLDED LINES INDICATE FLOW.
7. DIRECT PRESSURE RELIEF VALVE (PRV) DISCHARGE LINE DOWNWARD TO MINIMIZE POTENTIAL SPRAY TO SURROUNDING AREA.
8. CESIUM-137 ANALYZER DETECTS RADIATION VIA A DRY INTI WHICH IS INSTALLED INTEGRAL TO THE SHIELDED ENCLOSURE. THE ANALYZER IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III. THE SHIELDING ENCLOSURE IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III.
9. VALVE IS LOW POINT IN RESIN REMOVAL ROUTE.
10. HIGH HIGH TEMPERATURE (CXP-TSHH-0305 OR 0344) INITIATES EMERGENCY ELUTION. DETAILS ARE CONTAINED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE).
11. THE OUTER PIPE OF THE COAXIAL LINE SHOULD PROTRUDE A MINIMUM OF 4 INCHES INTO THE BLACK CELL FOR LEAK DETECTION PURPOSES.
12. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS, AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00003 REV. 4. DELETED AI-0347, ADDED COAXIAL PIPE AND REVISED QUALITY LEVEL AND SEISMIC CATEGORY DESIGNATION. REMOVED HOLDS. ADDED FULL DETAILED INSTRUMENTATION.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FUL 1 DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE REVISION).

REV	DESCRIPTION	ORG	CHK	PM/DM	PM/CM	DATE
0	ISSUED FOR CONSTRUCTION PER NOTE 12	WGS	JSB	CJF	REV	3/11/08

REVISION HISTORY

PROJECT No. 24590
SYS. PARCHEM
AREA 2600
BUILDING No. 10

CONTRACT No. DE-AC27-01RV14136

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

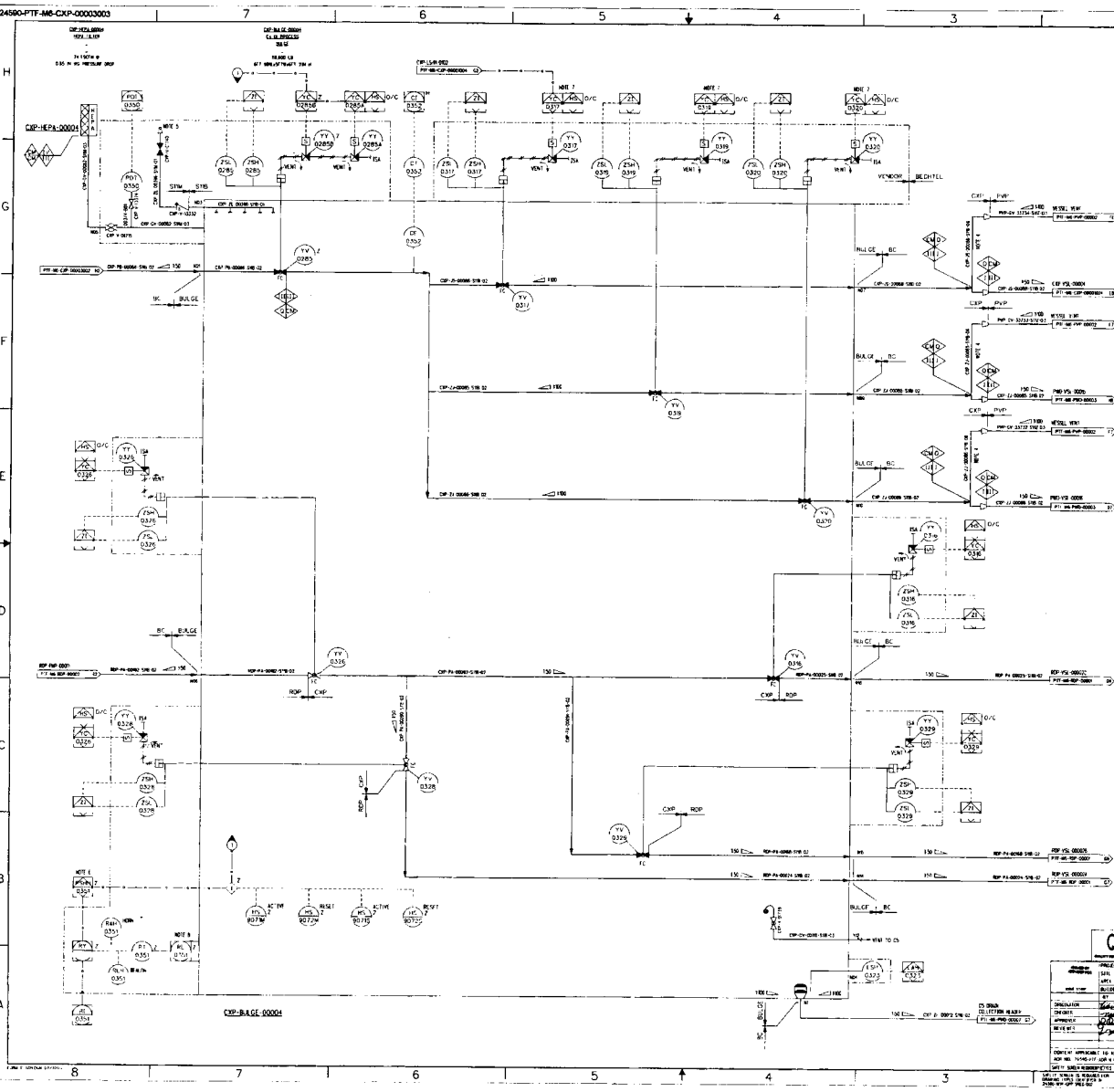
P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM COLUMNS
CXP-IXC-00004

SCALE NONE

24590-PTF-M6-CXP-00003002

REV 0

24590-PTF-M6-CXP-00003003



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL QM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. PIPELINES WILL INTERSECT AT AN ELEVATION NO LESS THAN 65'-0" BOTTOM REDUCER OF SIPHON BREAK TO BE AT LEAST 20 INCHES BELOW SIPHON BREAK INLET.
5. CONNECTION PROVIDED FOR PLANT WASH.
6. HIGH HIGH RADIATION TRIP (RSHH-0351) CLOSES VALVE CXP-YV-0285.
7. DETAILS OF VALVE POSITIONS DURING NORMAL OPERATIONS ARE CONTAINED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) CXP SYSTEM DESCRIPTION (FUTURE REVISION).
8. RE INSTRUMENT AND INTERLOCK ARE QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III.
9. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI SHEET DRAWINGS, AND, IN PART, SUPERSEDES 24590-PTF-M6-CXP-00001 REV. 4. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-M007-00043, AND IS FULL DETAILED INSTRUMENTATION.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE TO BE DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE REVISION).

REV	ISSUED FOR CONSTRUCTION SEE NOTE 1	DRC	7/16/04
REV	DESCRIPTION	DRG	CHK/APPROVED DATE

REVISION HISTORY

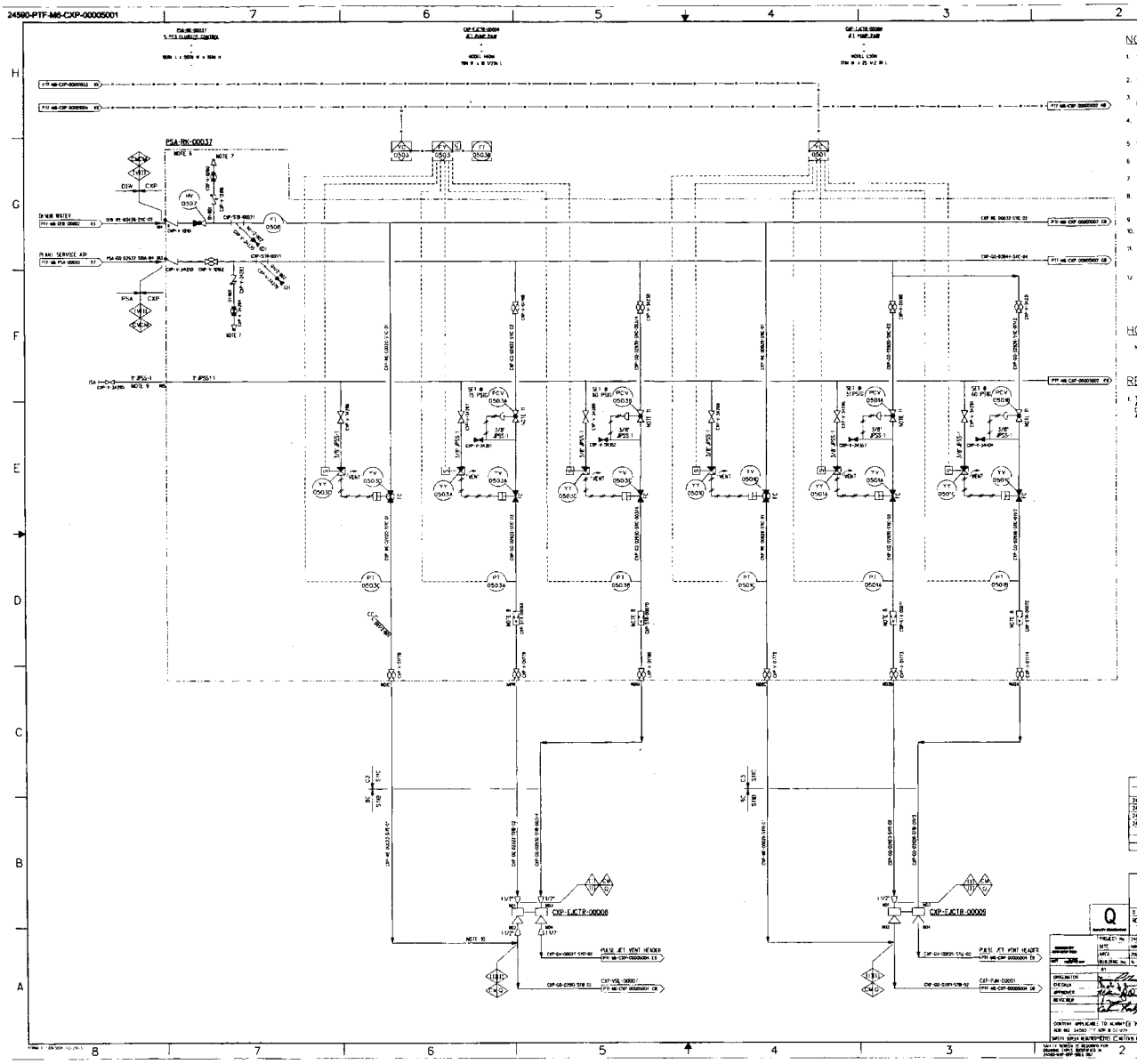
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM
BULGE
CXP-BULGE-00004

24590-PTF-M6-CXP-00003003 REV 0

24590-PTF-M6-CXP-00005001



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF-DRAINING, UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION REFER TO DRAWING 24590-PTF-M6-CXP-00001003 (CXP-V54-00004).
6. SEE PJM JET PUMP PAIR AND REVERSE FLOW DIVERTER CONTROL DETAIL 2 ON DRAWING 24590-WTP-M6-S0-00006.
7. CONNECTION PROVIDED FOR REAGENTS, PLANT WASH AND SERVICE AIR.
8. STRAINER IS A CONICAL PERFORM MAT TYPE PERFORATION WITH 1/8 INCH DIAMETER STAGGERED HOLES ON 3/16 INCH CENTERS PERMANENTLY INSTALLED.
9. ALL TUBING OUTSIDE THE RACK TO BE FIELD RUN.
10. A 45 DEGREE WYE PIPE FITTING SHALL BE USED AT THIS CONNECTION.
11. THE PCV CONTROL LINE CONNECTED TO A STRAIGHT RUN OF PIPE, 3 TO 5 FEET DOWNSTREAM OF THE PCV. THE PCV TO HAVE 3 FEET OF STRAIGHT PIPE RUN ON BOTH SIDES OF THE VALVE.
12. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI SHEET DRAWINGS AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00001 REV. 3. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-CXP-00026, 24590-PTF-M6N-MRT-00036, 00037, AND 00038.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE).

DRAWING INDEX

DWG NO	REV	TITLE
24590-PTF-M6-CXP-00005001	0	CXP SYSTEM UTILITY RACK PSA-RK-00037
24590-PTF-M6-CXP-00005002	0	CXP SYSTEM UTILITY RACK PSA-RK-00037
24590-PTF-M6-CXP-00005003	0	CXP SYSTEM UTILITY RACK PSA-RK-00037
24590-PTF-M6-CXP-00005004	0	CXP SYSTEM VESSEL PJM/RFD CXP-V31-00004

REV	DESCRIPTION	ORG	CHKD	SYMB	APVD	DATE
0	ISSUED FOR CONSTRUCTION (IFC NOTE 12)					12/1/08

REVISION HISTORY

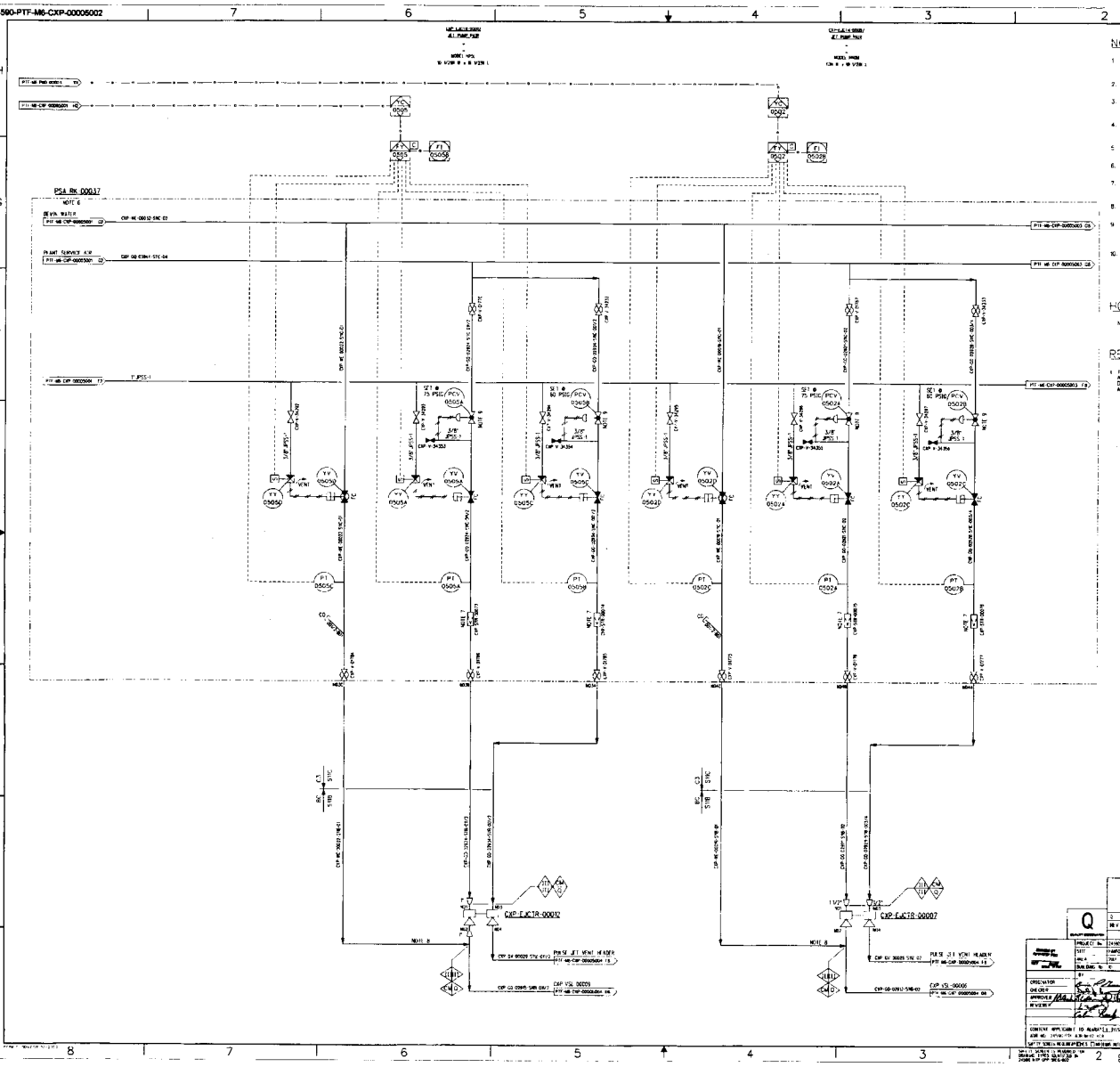
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99352

CONTRACT No DE AC27 01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM UTILITY RACK PSA-RK-00037

24590-PTF-M6-CXP-00005001 REV 0

24590-PTF-M6-CXP-00005002



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-50-00008 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SCOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL CW AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF-DRAINING, UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION REFER TO DRAWING 24590-PTF-M6-CXP-00005003 (CXP-VSL-00004)
6. SEE PUM JET PUMP PAIR AND REVERSE FLOW DIVERTER CONTROL DETAIL 2 ON DRAWING 24590-WTP-M6-50-00006.
7. STRAINER IS A CONICAL PILGRIM HAT TYPE PERFORATED, WITH 1/8 INCH DIAMETER STAGGERED HOLES ON 3/16 INCH CENTERS, PERMANENTLY INSTALLED.
8. A 45 DEGREE WYE PIPE FITTING SHALL BE USED AT THIS CONNECTION.
9. THE PCV CONTROL LINE TO BE CONNECTED TO A STRAIGHT RUN OF PIPE 3 TO 5 FEET DOWNSTREAM OF THE PCV. THE PCV TO HAVE 3 FEET OF STRAIGHT PIPE RUN ON BOTH SIDES OF THE VALVE.
10. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00005 REV. 3. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-CXP-00026, 24590-PTF-M6M-M001-00036, -00037, AND -00038.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. TMP, REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE).

REV	DESCRIPTION	ORIG	CONST	REVIEW	APVD	DATE
0	ISSUED FOR CONSTRUCTION (SEE NOTE 10)					7/1/08

REVISION HISTORY

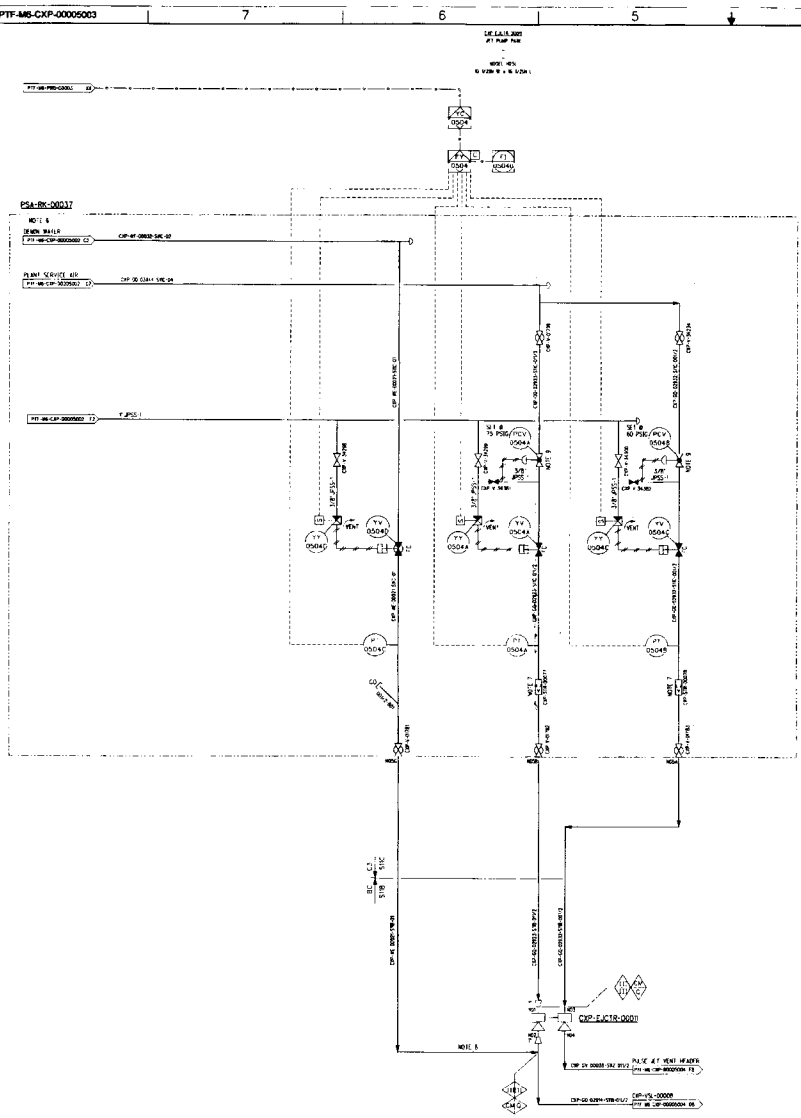
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM UTILITY RACK PSA-RK-00037

24590-PTF-M6-CXP-00005002 — REV 0

24590-PTF-M6-CXP-00005003



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-II, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHEN ARE SELF DRAINING UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION REFER TO DRAWING 24590-PTF-M6-CXP-00001003 (CXP-VSL-000041)
6. SEE RUN JET PUMP PAIR AND REVERSE FLOW DIVERTER CONTROL DETAIL 2 ON DRAWING 24590-WTP-M6-S0-00006.
7. STRAINER IS A CONICAL PILORIM HAT TYPE PERFORATED WITH 1/8 INCH DIAMETER STAGGERED HOLES ON 3/16 INCH CENTERS PERMANENTLY INSTALLED
8. A 45 DEGREE WYE PIPE FITTING SHALL BE USED AT THIS CONNECTION.
9. THE PCV CONTROL LINE TO BE CONNECTED TO A STRAIGHT RUN OF PIPE 3 TO 5 FEET DOWNSTREAM OF THE PCV. THE PCV TO HAVE 3 FEET OF STRAIGHT PIPE RUN ON BOTH SIDES OF THE VALVE.
10. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI SHEET DRAWINGS AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00005 REV 3. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-CXP-00036, -00037, AND -00038.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE)

REV	DESCRIPTION	DRG	CHKD	REVIEWED	APVD	DATE
Q	ISSUED FOR CONSTRUCTION SEE REV. 0					7/1/02

REVISION HISTORY

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

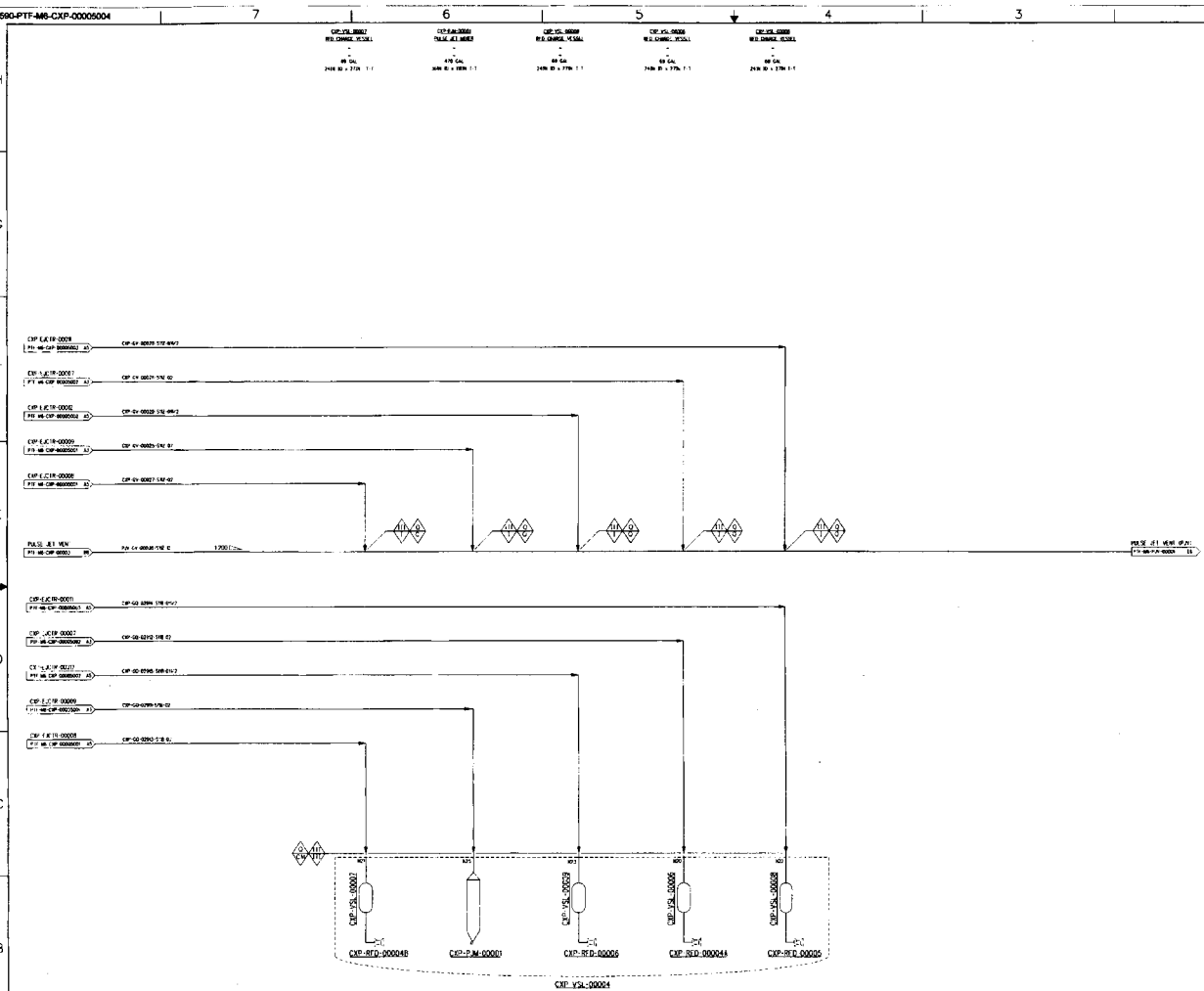
CONTRACT No DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM UTILITY RACK PSA-RK-00037

24590-PTF-M6-CXP-00005003 REV 0

SCALE: NONE

24590-PTF-M6-CXP-00005004



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-SC-00001 THROUGH 24590-WTP-M6-SC-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING (INCLUDING PULSE JET VENT LINES) IS QUALITY LEVEL 2 AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED. PULSE JET MIXER AND REVERSE FLOW DIVERTER ARE QUALITY LEVEL 2M AND SEISMIC CATEGORY SC-III.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION, REFER TO DRAWING 24590-PTF-MA-CXP-00001003 (CXP-VSL-00004).
6. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND IN PART, SUPERSEDES 24590-PTF-M6-CXP-00005, REV. 3. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6A-CXP-00028, AND 24590-PTF-M6A-M6D1-00036, -00037, AND -00028.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

NONE

REV	DESCRIPTION	DRC	CHK	ENG	DATE
G	ISSUED FOR CONSTRUCTION SEE NOTE 5				2/1/08

REVISION HISTORY

PROJECT No. 24590
WBS
CDA
BUILDING No. TF

NEWLY IMPLEMENTED PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

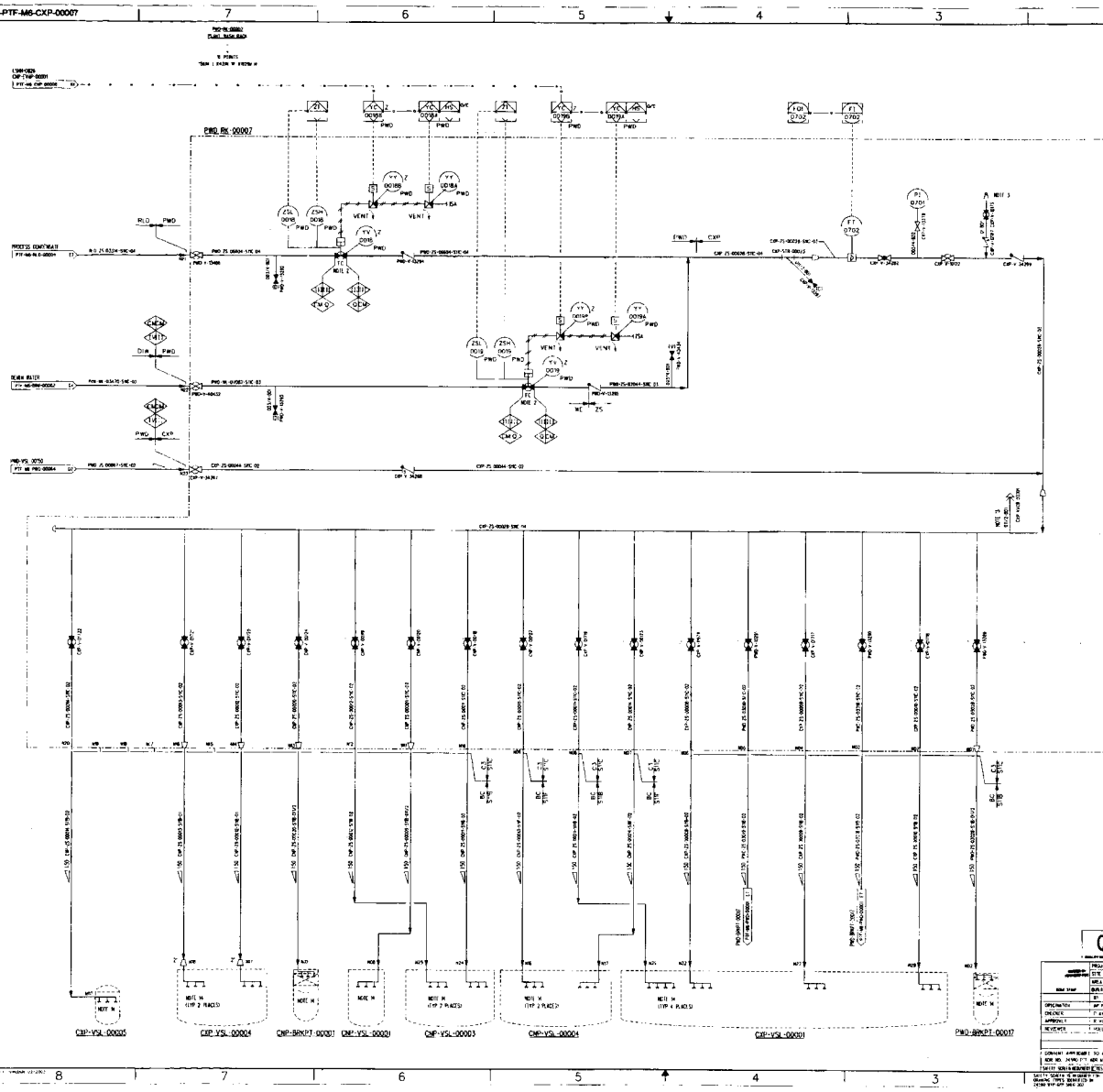
CONTRACT No. DE-AC27-01RV14136

ORIGINATOR
CHECKER
APPROVER
REVIEWER

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM VESSEL PJM/RFD CXP-VSL-00004

24590-PTF-M6-CXP-00005004 G

24590-PTF-M6-CXP-00007



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00006 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. VALVES INTERLOCKED TO PREVENT MULTIPLE VALVES OPERATION
3. CONNECTION PROVIDED FOR REAGENTS, PLANT WASH, AND SERVICE AIR
4. FOR PROCESS INFORMATION, REFER TO DRAWINGS 24590-PTF-M6-CNP-00001, 24590-PTF-M6-CXP-00002, 24590-PTF-M6-CXP-00001, AND 24590-PTF-M6-PWD-00001
5. DELETED
6. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
7. DELETED
8. THE PRESSURE BOUNDARY FOR ALL COMPONENTS SHOWN ON THIS DRAWING IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
9-10. DELETED
11. ALL LINES ON THIS DRAWING SHALL BE FREE DRAINING, UNLESS OTHERWISE NOTED.
12. DELETED
13. BRANCH TO BE CONNECTED TO HORIZONTAL RUN OF HEADER PIPE
14. PIPE ROUTING LIMITED TO A MAXIMUM OF AN 8 FT STRAIGHT VERTICAL DROP AT THE CONNECTION OF R-K VESSEL
15. REVISION 1: REMOVED HOLD 1, ADDED 13-105, CHANGED CLOSE PLR TSM, ADDED REDUCERS, UPDATED NOTES AND INCORPORATED DCN 24590-PTF-M6N-CXP-00002, 24590-PTF-M6N-M801-00001, AND 24590-PTF-M6N-M807-00001
16. REVISION 2: MAJOR REVISION NO. REVISION CLOUDS REQUIRED. REVISED TO INCORPORATE 24590-PTF-M6N-M801-00002, -00037, AND -00014. INCORPORATED AND FURTHER REVISED 24590-PTF-M6N-CXP-00003. ADDED VACUUM BREAKER, VORTEX METER, REAGENT / FLUSH LINE FROM PWD VSL 00150, HIGH POINT VENT, DRAIN, & VALVES. CHANGED QUALITY LEVEL, SEISMIC CATEGORY, AND SYMBOLS. DELETED COMMENTS. REVISED/ADDED/DELETED NOTES, HOLDS AND REFERENCES.

HOLD/OPEN ITEMS:

1-3. DELETED

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERACT POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE).

REV	DESCRIPTION	CRC	CHKD	RVWD	APVD	DATE
2	REVISED PER NOTE 16					2-21-02
1	REVISED PER NOTE 15	EF	FV		RL	4/23/01
0	ISSUED FOR CONSTRUCTION	MR	FV	MS	RL	5/29/00

Q

REVISION HISTORY

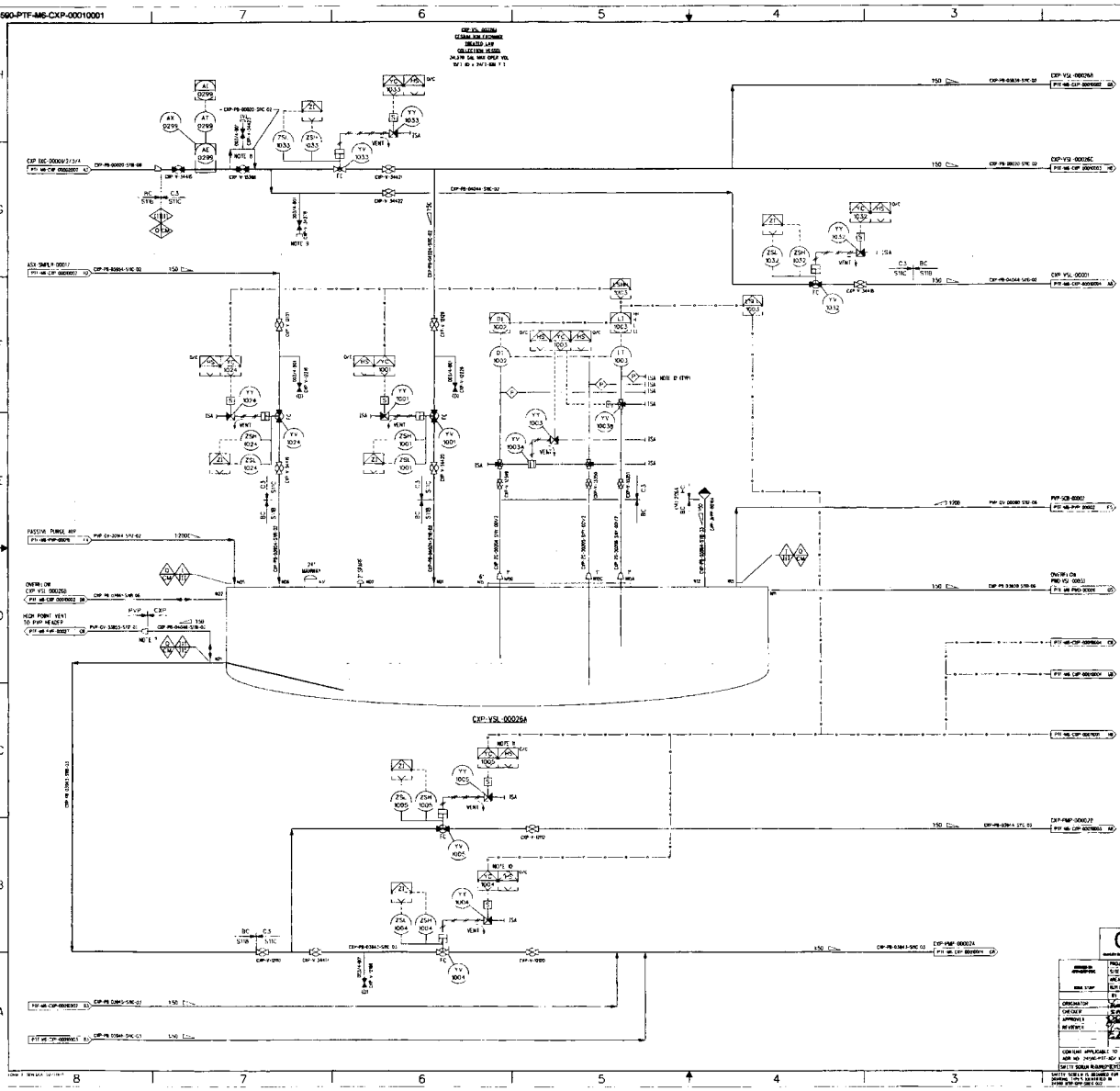
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM PLANT WASH RACK PWD-RK-00007

24590-PTF-M6-CXP-00007 REV 2

24590-PTF-M6-CXP-00010001



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00006 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SCOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING EXCEPT BLACK CELL WHICH ARE SELF-DRAINING, UNLESS OTHERWISE NOTED.
5. FOR PULSE JET MIXER DETAILS, SEE DRAWINGS 24590-PTF-M6-CXP-00001 AND -00012.
6. FOR VESSEL WASH RACK DETAILS, SEE DRAWING 24590-PTF-M6-CXP-00013.
7. MINIMUM HEIGHT GREATER THAN OVERFLOW HEIGHT
8. LINE SEGMENT FOR CESIUM 137 ANALYZER AE0299 MUST BE FULL DURING NORMAL OPERATION FOR ACCURATE MEASUREMENT. ELEVATION OF LOOP IS APPROXIMATELY 4' ABOVE RE0262 TO FLOOD LINE SEGMENT. SEE DRAWING 24590-PTF-M6-CXP-00002002.
9. HOSE CONNECTION PROVIDED TO BACK FLUSH LINE.
10. SEE TABLE 7.9 OF CXP-SYSTEM DESCRIPTION (FUTURE REVISION).
11. SEE TABLE 7.10 OF CXP-SYSTEM DESCRIPTION (FUTURE REVISION).
12. SEE DRAWING 24590-PTF-M6-ISA-00008 FOR BUBBLE RACKS AND SYSTEM CONNECTIONS.
13. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI SHEET DRAWINGS AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00010 REV 3. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-CXP-00037, 24590-PTF-M6N-M507-00025, -00037, AND -00038

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE REVISION).

DRAWING INDEX	
DWG NO	TITLE
24590-PTF-M6-CXP-00010001	CXP SYSTEM TREATED LAW COL: CXP-VSL-00026A
24590-PTF-M6-CXP-00010002	CXP SYSTEM TREATED LAW COLL CXP-VSL-00026B
24590-PTF-M6-CXP-00010003	CXP SYSTEM TREATED LAW COLL CXP-VSL-00026C
24590-PTF-M6-CXP-00010004	CXP SYSTEM TREATED LAW COLL CXP-PMP-00002A/B

REV	DESCRIPTION	DRG	CHKD	REVIEW	APVD	DATE
0	ISSUED FOR CONSTRUCTION SEE NOTE 13					7/24/08

REVISION HISTORY

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

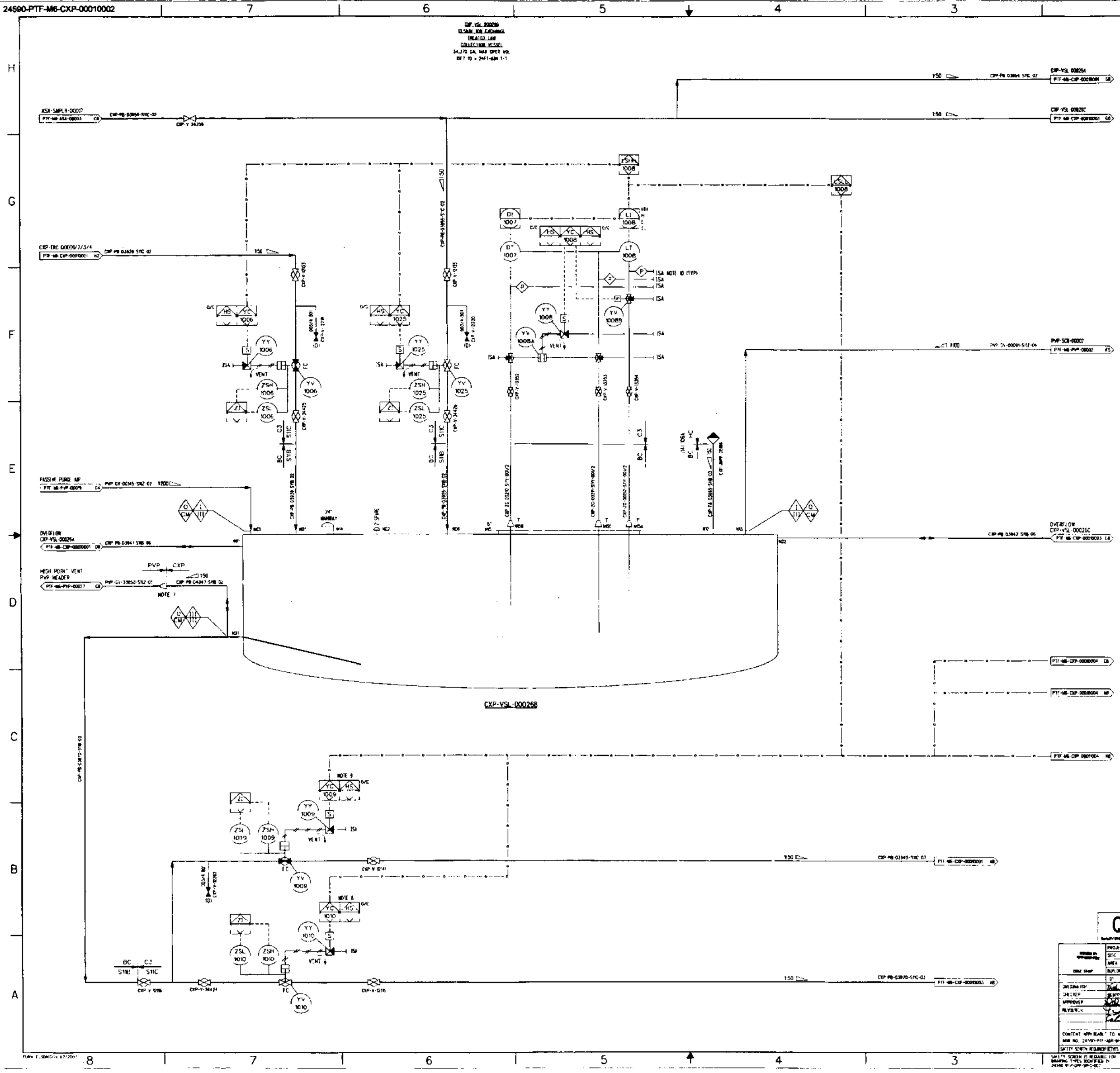
CONTRACT No DE-AC27-01RV14136

P&ID - PTF CESIUM ION EXCHANGE PROCESS SYSTEM - TREATED LAW COLLECTION VESSEL CXP-VSL-00026A

SCALE NONE

24590-PTF-M6-CXP-00010001

REV 0



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF-DRAINING, UNLESS OTHERWISE NOTED.
5. FOR PULSE JET MIXER DETAILS, SEE DRAWINGS 24590-PTF-M6-CXP-00011, AND -00012.
6. FOR VESSEL WASH RACK DETAILS, SEE DRAWING 24590-PTF-M6-CXP-00013.
7. MINIMUM HEIGHT GREATER THAN OVERFLOW HEIGHT
8. SEE TABLE 7.9 OF CXP SYSTEM DESCRIPTION (FUTURE REVISION).
9. SEE TABLE 7.10 OF CXP-SYSTEM DESCRIPTION (FUTURE REVISION)
10. SEE DRAWING 24590-PTF-M6-ISA-00008 FOR BUBBLE RACKS AND SYSTEM CONNECTIONS.
11. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND, IN PART, SUPERSEDES 24590-PTF-M6-CXP-00010 REV 3. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-M80T-00025, 00037, AND 00038.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE)

REV	DESCRIPTION	ORG	CHKD	RVWD	APVD	DATE
0	ISSUED FOR CONSTRUCTION SEE NOTE 11	VLC	SJ	[illegible]	[illegible]	7/25/08

REVISION HISTORY

Q

PROJECT No. 24590
SITE HANFORD
AREA 2000
BUILDING No. 2000

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No DE-AC27-01RV14136

	BY	DATE
ORIGINATOR	[signature]	4/25/08
CHECKER	[signature]	[illegible]
APPROVER	[signature]	7/24/08
REVIEWER	[signature]	7/24/08
	[signature]	[illegible]

CONTENT APPLICABLE TO ALARA? [X] YES [ ] NO
ADR NO. 24590-PTF-ADR-M-02-074 REV: 4
SAFETY SCREEN REQUIRED? [X] YES [ ] NO

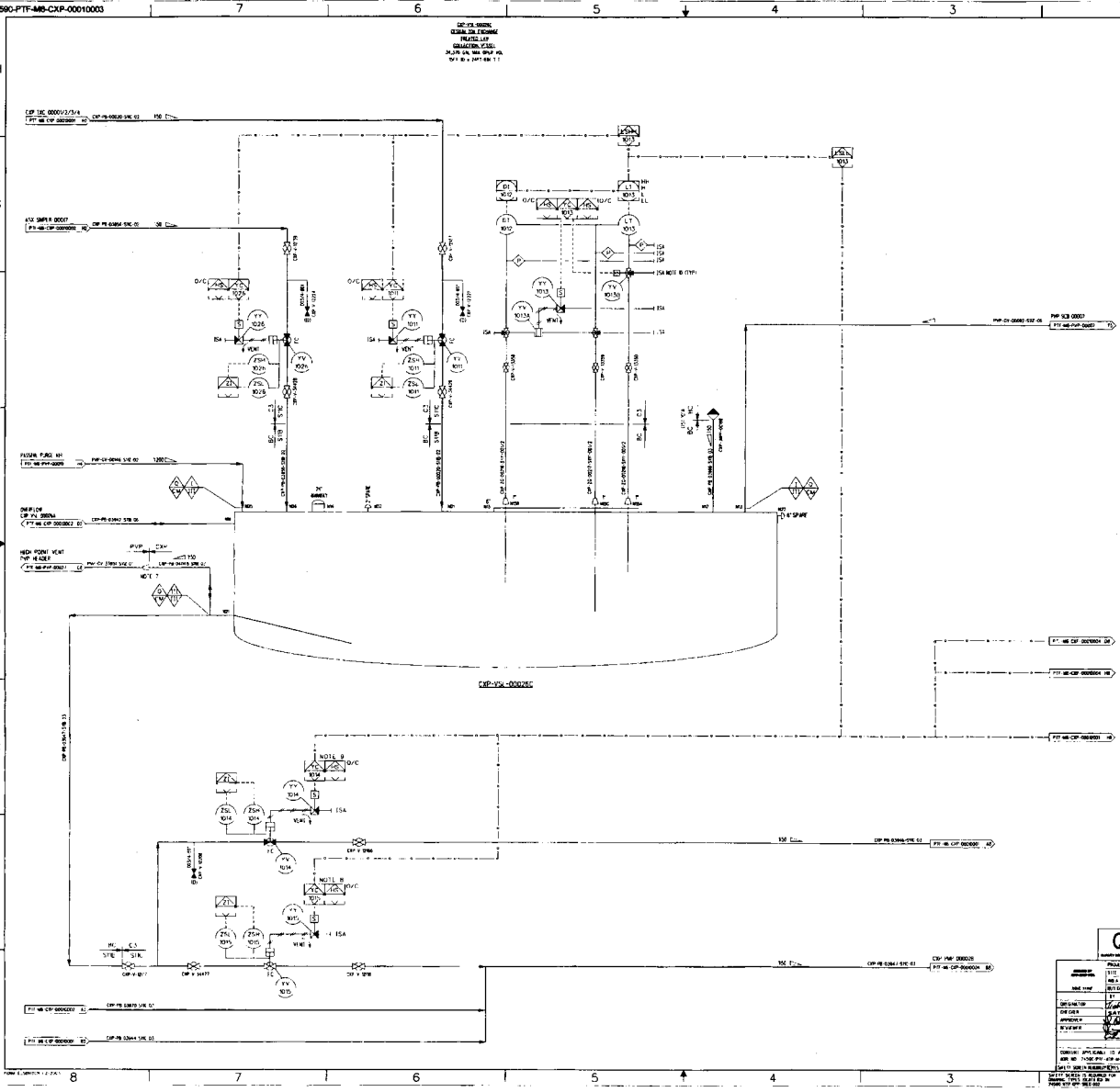
P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM - TREATED LAW COLLECTION VESSEL CXP-VSL-00026B

SCALE NONE
24590-PTF-M6-CXP-00010002
REV 0

SAFETY SCREEN IS REQUIRED FOR DRAWING TYPES IDENTIFIED IN 24590-WTP-GPP-SPG-007
E SIZE - 44x34
COMPUTER GENERATED - MANUAL CHANGES NOT PERMITTED

09/24/2008 04:10:49 PM

24590-PTF-M6-CXP-00010003



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS, AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF-DRAINING, UNLESS OTHERWISE NOTED.
5. FOR PULSE JETMIXER DETAILS, SEE DRAWINGS 24590-PTF-M6-CXP-00011 AND -00012.
6. FOR VESSEL WASH RACK DETAILS, SEE DRAWING 24590-PTF-M6-CXP-00013.
7. MINIMUM HEIGHT GREATER THAN OVERFLOW HEIGHT.
8. SEE TABLE 7.9 OF CXP-SYSTEM DESCRIPTION (FUTURE REVISION).
9. SEE TABLE 7.10 OF CXP-SYSTEM DESCRIPTION (FUTURE REVISION).
10. SEE DRAWING 24590-PTF-M6-ISA-00006 FOR BUBBLE RACKS AND SYSTEM CONNECTIONS.
11. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS, AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00001. ALL THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-M601-00021, -00037, AND -00039.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERACT POINTS ARE FULLY DESCRIBED IN THE CXP-SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP-SYSTEM DESCRIPTION (FUTURE).

REV	DESCRIPTION	DRG CHKD	REVISED	DATE
1	INFO FOR CONTRACTOR SO NOTE 1			7/11/07

REVISION HISTORY

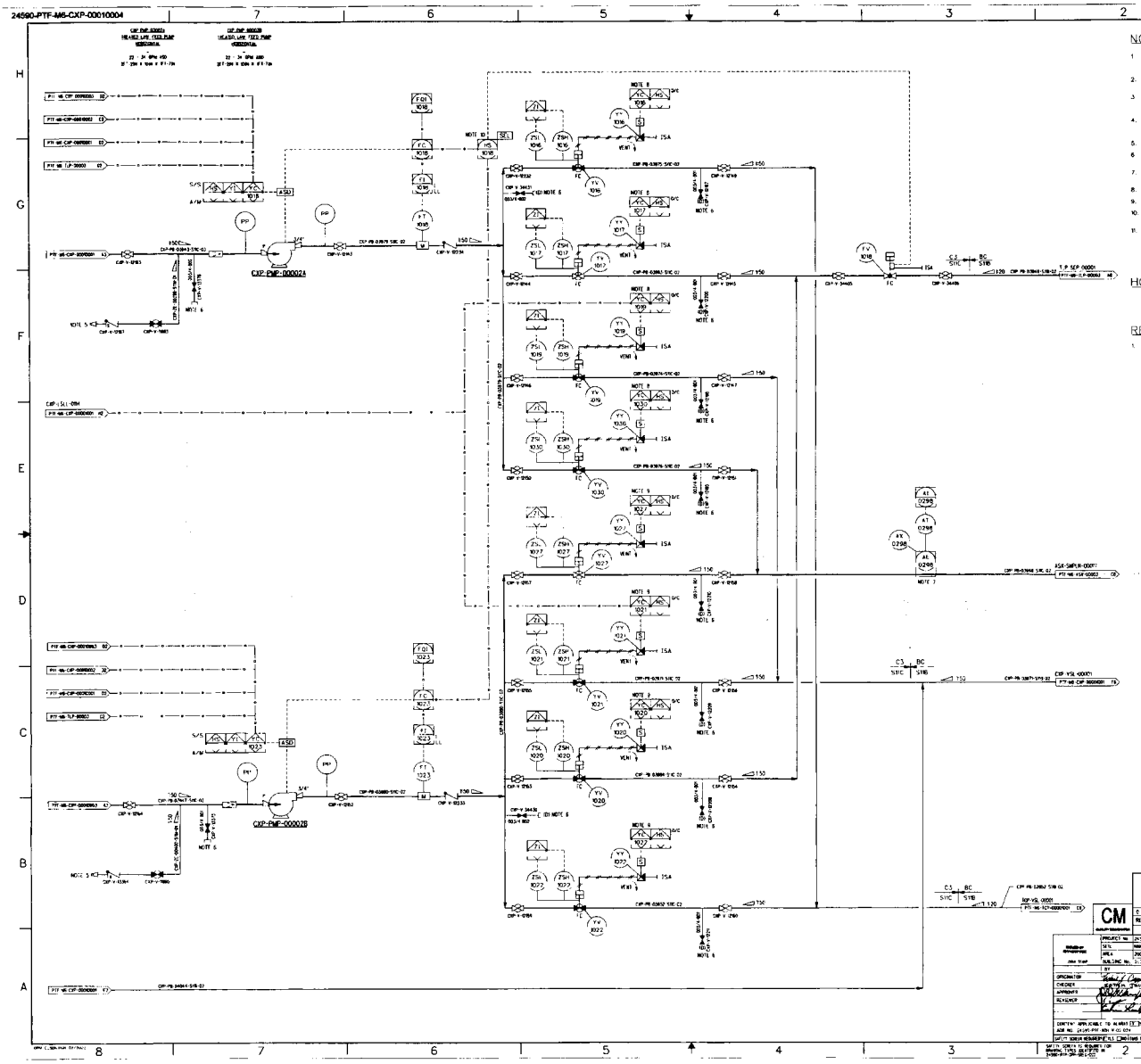
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM - TREATED LAW COLLECTION VESSEL
CXP-VSL-00026C

24590-PTF-M6-CXP-00010003 REV 0

24590-PTF-M6-CXP-00010004



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF DRAINING, UNLESS OTHERWISE NOTED.
5. CONNECTION PROVIDED FOR REAGENTS AND PLANT WASH.
6. PUMP MAINTENANCE DRAINS ARE TO BE ROUTED TO COLLECTION CONTAINERS AND PROPERLY MANAGED AS DANGEROUS WASTE.
7. LINE SEGMENT FOR AE0298 MUST BE FULL DURING NORMAL OPERATIONS FOR ACCURATE MEASUREMENT.
8. SEE TABLE 7.9 ON SYSTEM DESCRIPTION (FUTURE REVISION).
9. SEE TABLE 7.10 ON SYSTEM DESCRIPTION (FUTURE REVISION).
10. WHEN TRANSFERRING TO TLP-SEP-00001, PUMP IS OPERATOR AT A FIXED SPEED.
11. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS, AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00010 REV. 3. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N CXP-00037, 24590-PTF-M6N MPRT-00025, 00037, AND 00038.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE REVISION).

REV	DESCRIPTION	ORG	CHKD	REVIEWED	APVD	DATE
0	ISSUED FOR CONSTRUCTION SEE NOTE 7	WSC	S.T.			9/26/02

REVISION HISTORY

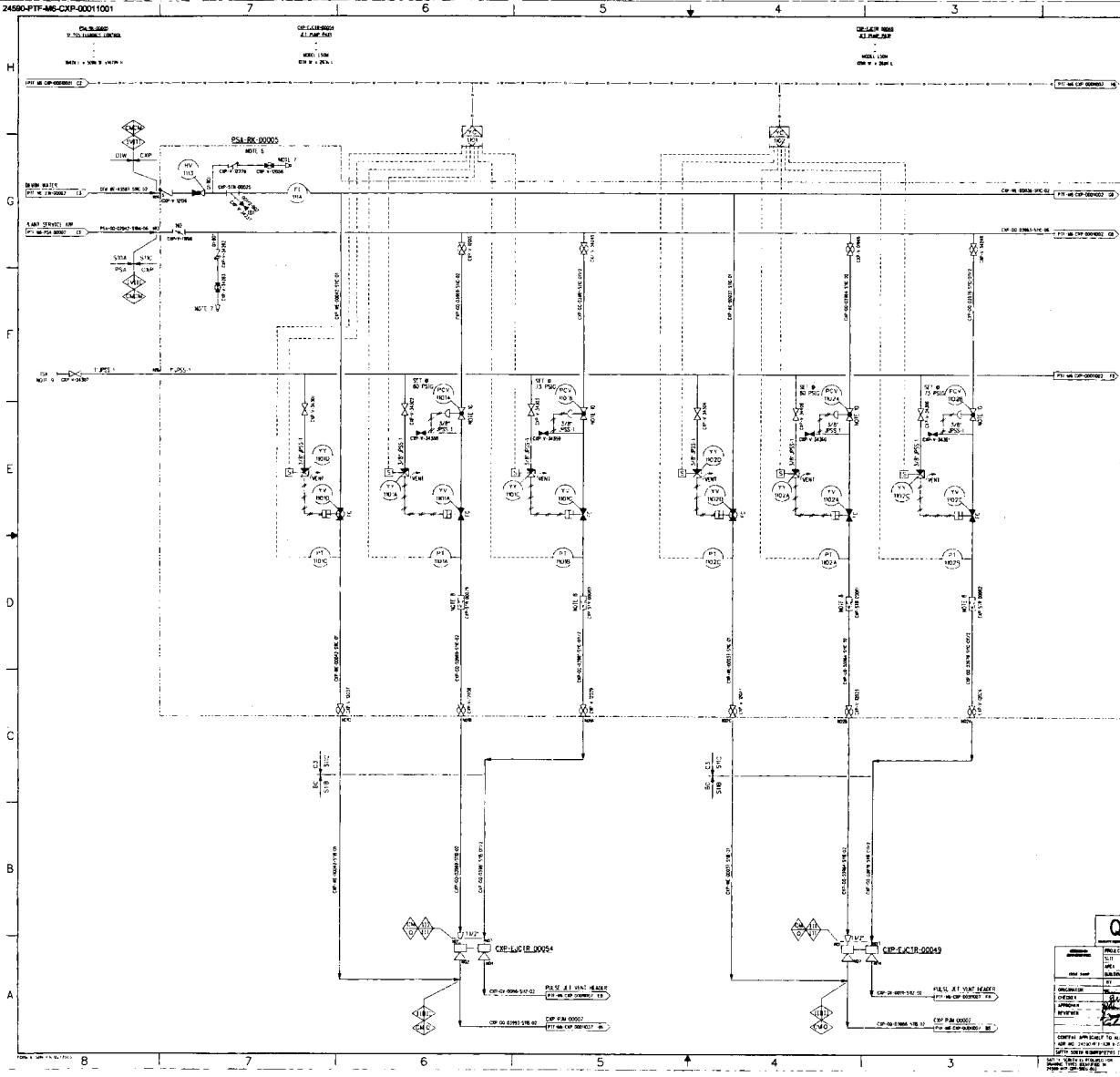
PROJECT No. 24590
SCALE NONE
DRAWN BY WSC
DATE 9/26/02
CONTRACT No. DE-AC27-01RV14136

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND WA 99354

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM - TREATED LAW COLLECTION PUMPS
CXP-PMP-00002A/B

24590-PTF-M6-CXP-00010004 REV 0

24590-PTF-M6-CXP-00011001



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL QM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE PWTF DRAWING, EXCEPT BLACK CELL LINES WHICH ARE SELF DRAWING, UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION, REFER TO DRAWING 24590-PTF-M6-CXP-00010001.
6. SEE JET PUMP PAIR CONTROL DETAIL 2 DRAWING 24590-WTP-M6-50-00006.
7. CONNECTION PROVIDED FOR REAGENTS, PLANT WASH AND SERVICE AIR.
8. STRAINER IS A CONICAL PILGRIM HAT TYPE STRAINER WITH PERFORATED 1/8 INCH DIAMETER STAGGERED HOLES ON 3/16 INCH CENTERS. PERMANENTLY INSTALLED.
9. ALL TUBING OUTSIDE THE RACK TO BE FIELD RUN.
10. THE PCV CONTROL LINE CONNECTED TO A STRAIGHT RUN OF PIPE ≥ 10.5 FEET DOWNSTREAM OF THE PCV. THE PCV TO HAVE 3 FEET OF STRAIGHT PIPE RUN ON BOTH SIDES OF THE VALVE.
11. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI SHEET DRAWINGS AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00011001. IN PART, DRAWING INCLUDES INFORMATION FROM 24590-PTF-MEN-CXP-00027 AND 24590-PTF-MEN-MB07-00036, 00037, AND 00038.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE).

DRAWING INDEX

DWG NO	TITLE
24590-PTF-M6-CXP-00010001	CXP SYSTEM UTILITY RACK PSA-RK-00005
24590-PTF-M6-CXP-00010002	CXP SYSTEM UTILITY RACK PSA-RK-00005
24590-PTF-M6-CXP-00010003	CXP SYSTEM UTILITY RACK PSA-RK-00005
24590-PTF-M6-CXP-00010004	CXP SYSTEM UTILITY RACK PSA-RK-00005
24590-PTF-M6-CXP-00010005	CXP SYSTEM UTILITY RACK PSA-RK-00005
24590-PTF-M6-CXP-00010006	CXP SYSTEM UTILITY RACK PSA-RK-00005
24590-PTF-M6-CXP-00010007	CXP SYSTEM VESSELS PUMP TAP VSL 00026A/B

REV	DESCRIPTION	DRN	CHKD/APVD/APVD	DATE
0	ISSUED FOR CONSTRUCTION W/ NOTE 11			

REVISION HISTORY

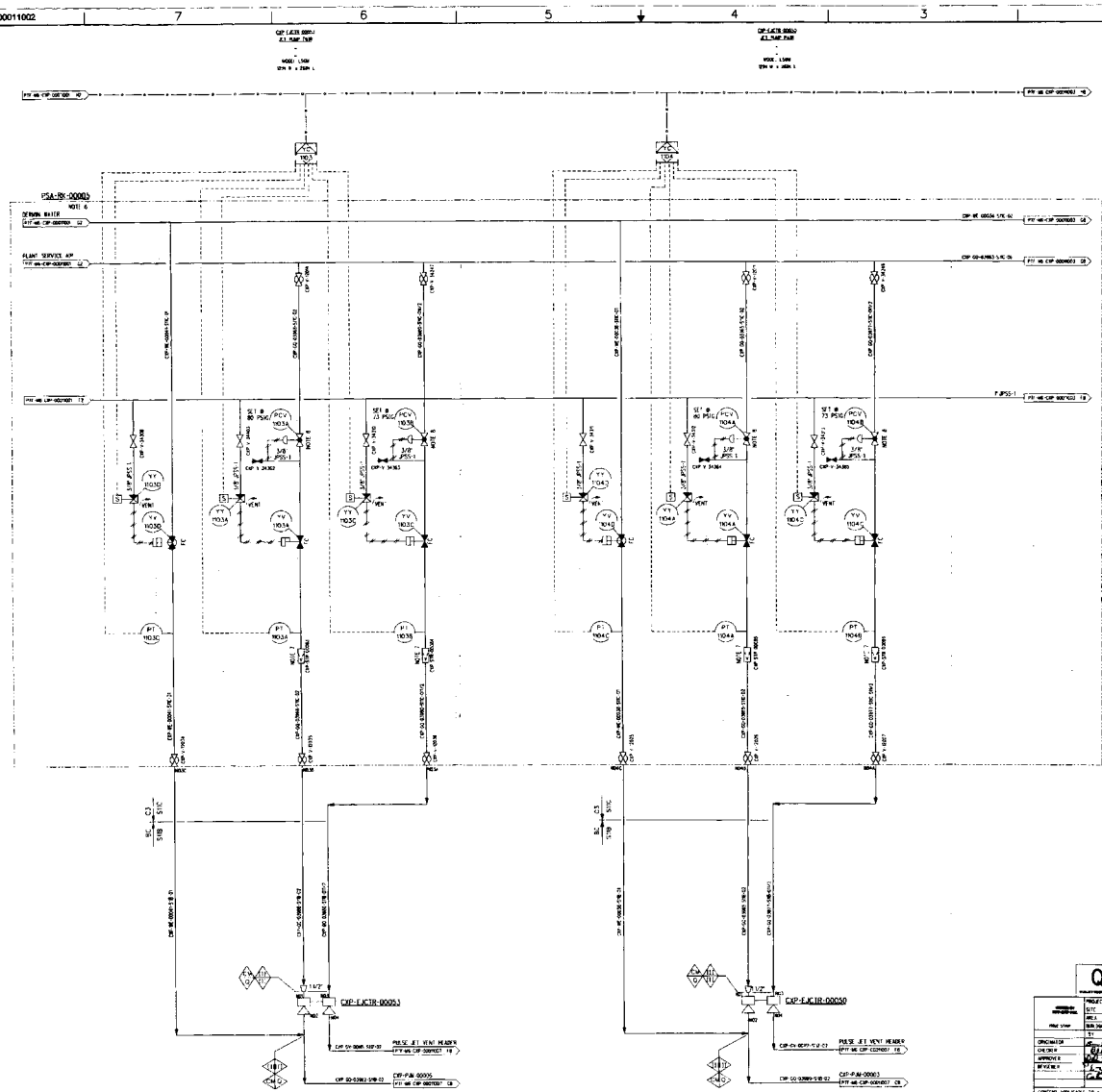
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM
UTILITY RACK PSA-RK-00005

24590-PTF-M6-CXP-00011001 — REV 0

24590-PTF-M6-CXP-00011002



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF DRAINING, UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION, REFER TO DRAWING 24590-PTF-M6-CXP-00001001
6. SEE JET PUMP PAIR CONTROL DETAIL 2 ON DRAWING 24590-WTP-M6-S0-00008
7. STRAINER IS A CONICAL PILGRIM HAT TYPE STRAINER WITH PUNCHED 1/8 INCH DIAMETER STAGGERED HOLES ON 3/16 INCH CENTERS, PERMANENTLY INSTALLED.
8. THE PCV CONTROL LINE CONNECTED TO A STRAIGHT RUN OF PIPE 3 TO 5 FEET DOWNSTREAM OF THE PCV. THE PCV TO HAVE 3 FEET OF STRAIGHT PIPE RUN ON BOTH SIDES OF THE VALVE.
9. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS, AND IN PART, SUPERSEDES 24590-PTF-M6-CXP-00011 REV. 3. THIS DRAWING INCLUDES INFORMATION FROM: 24590-WTP-M6N-CXP-00027, AND 24590-PTF-M6N-MBCT-00036, -00037, AND -00038

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED WATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE).

REV.	DESCRIPTION	DRC	CHKD	RVWD	APVD	DATE
0	ISSUED FOR CONSTRUCTION BY WOFF 5					

REVISION HISTORY

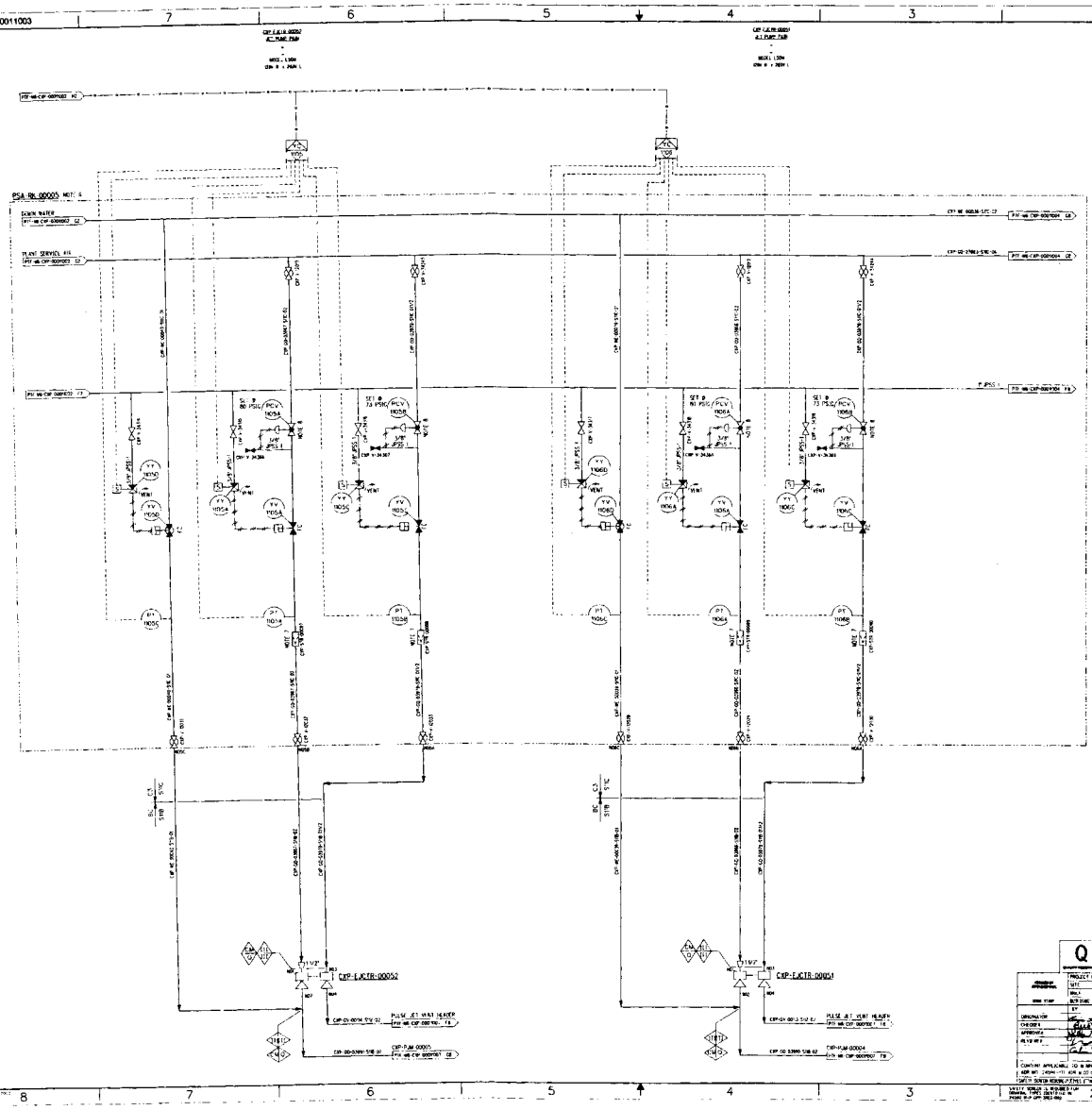
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM UTILITY RACK PSA-RK-00005

24590-PTF-M6-CXP-00011002 REV. 0

24590-PTF-M6-CXP-00011003



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SCOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-II, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF DRAINING, UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION, REFER TO DRAWING 24590-PTF-M6-CXP-00001001.
6. SEE JET PUMP PAIR CONTROL DETAIL 2 ON DRAWING 24590-WTP-M6-S0-00006.
7. STRAINER IS A CONICAL PILGRIM HAT TYPE STRAINER WITH PERFORATED 1/8 INCH DIAMETER STAGGERED HOLES ON 3/16 INCH CENTERS, PERMANENTLY INSTALLED.
8. THE PCV CONTROL LINE CONNECTED TO A STRAIGHT RUN OF PIPE 5 TO 5 FEET DOWNSTREAM OF THE PCV. THE PCV TC HAVE 3 FEET OF STRAIGHT PIPE RUN ON BOTH SIDES OF THE VALVE.
9. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND IN PART SUPERSEDES 24590-PTF-M6-EXP-00016 REV. 1. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6A-CXP-00027, AND 24590-PTF-M6W-MB01-00035, 00037, AND -00038.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATION (INTERFACE POINTS) ARE FULLY DESCRIBED IN THE CXP SYSTEM FLOW DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE).

REVISION HISTORY

REV	DESCRIPTION	DKG	CHKD	REVIEWED	DATE
E	ISSUED FOR CONSTRUCTION (IFC)				

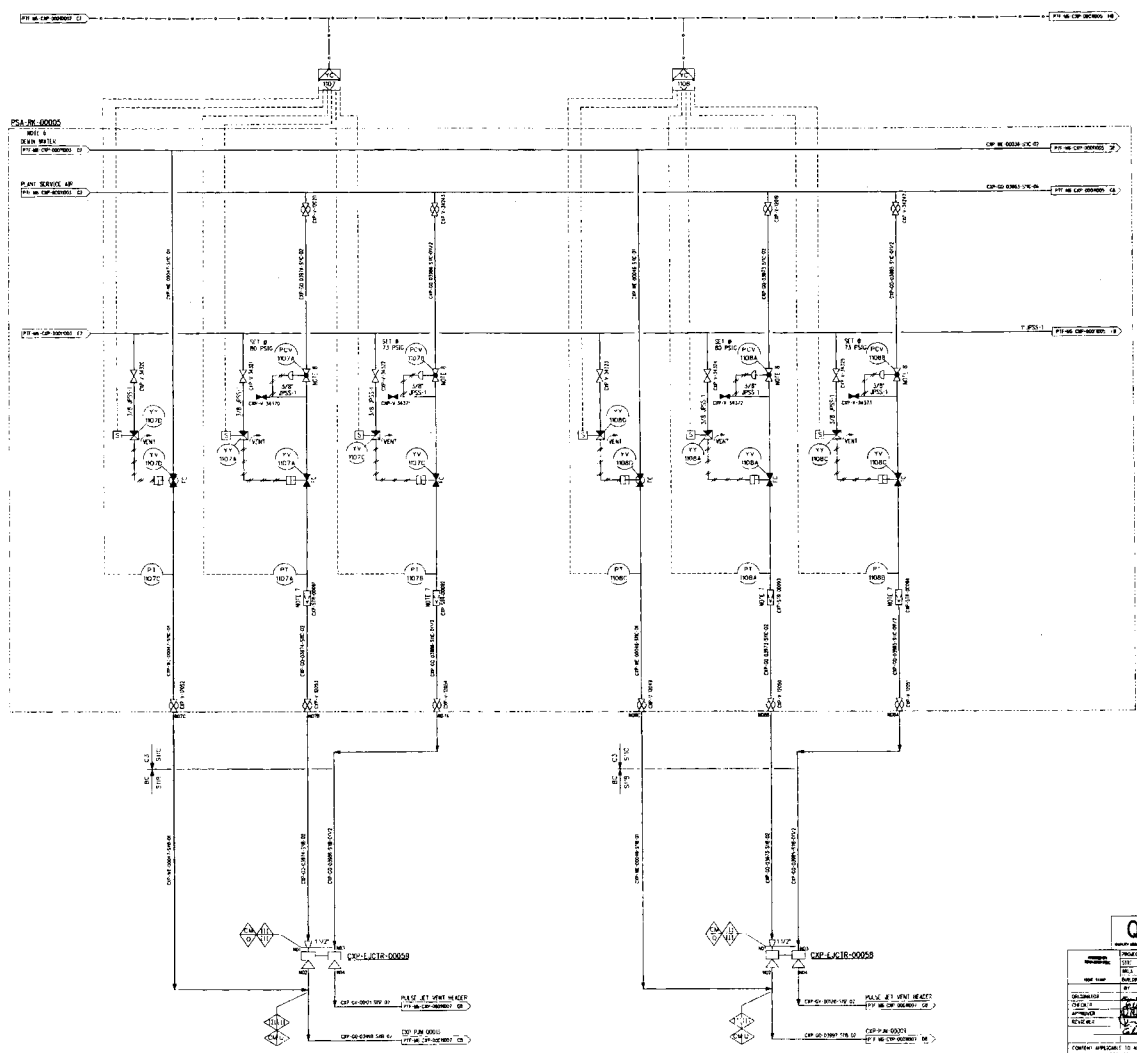
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM UTILITY RACK PSA-RK-00005

24590-PTF-M6-CXP-00011003 REV 0

24590-PTF-M6-CXP-00011004



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-ND-00001 THROUGH 24590-WTP-M6-SD-00005 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SUPPORT REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL CM, AND SEISMIC CATEGORY SC (UNLESS OTHERWISE NOTED).
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING EXCEPT BLACK CELL LINES WHICH ARE SELF DRAINING UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION REFER TO DRAWING 24590-PTF-M6-CXP-00010002.
6. SEE JET PUMP PAIR CONTROL DETAIL 2 ON DRAWING 24590-WTP-M6-ND-00006.
7. STRAINER IS A CONICAL PERFORM HAT TYPE STRAINER WITH PERFORMATE 3/16 INCH DIAMETER STAGGERED HOLES ON 5/16 INCH CENTERS, PERMANENTLY INSTALLED.
8. THE PCV CONTROL LINE CONNECTED TO A STRAIGHT RUN OF PIPE 3 TO 5 FEET DOWNSTREAM OF THE PCV. THE PCV DO HAVE 3 FEET OF STRAIGHT PIPE RUN ON BOTH SIDES OF THE VALVE.
9. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00011 REV. 1. THIS DRAWING INCLUDES INFORMATION FROM 24590-WTP-M6N-CXP-00027/-00036 -00037, AND -00038.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE).

REV	DESCRIPTION	DRC	CHKD	ENGR	APPROVE	DATE
Q	ISSUED FOR CONSTRUCTION SET NO. 1					7-27-98

REVISION HISTORY

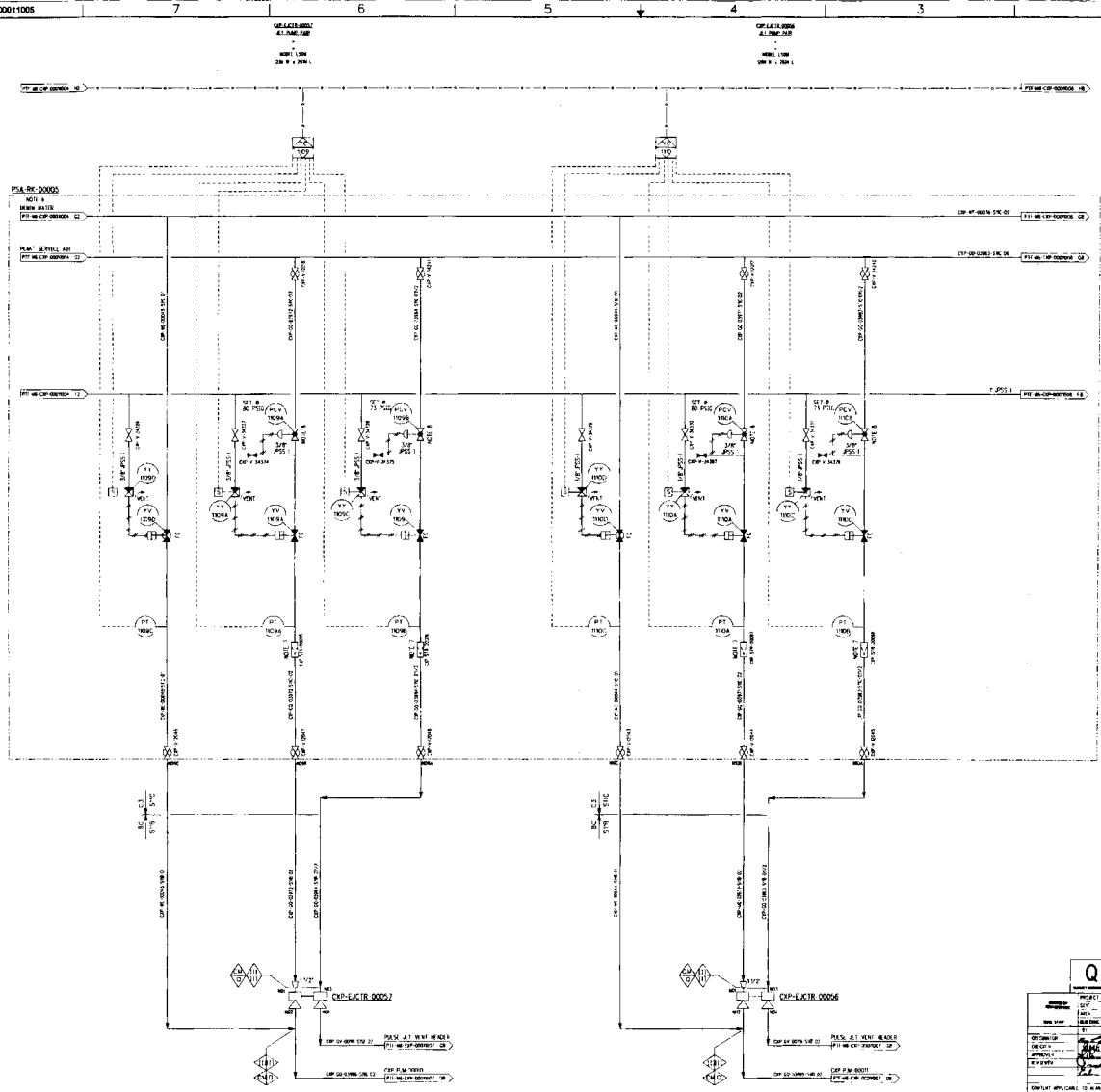
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE
PROCESS SYSTEM
UTILITY RACK
PSA-RK-00005

SCALE: NONE
24590-PTF-M6-CXP-00011004
REV. 0

24590-PTF-M6-CXP-00011005



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF-DRAINING UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION, REFER TO DRAWING 24590-PTF-M6-CXP-00010002.
6. SEE JET PUMP PWR CONTROL DETAIL 2 ON DRAWING 24590-WTP-M6-S0-00006.
7. STRAINER IS A CONICAL PILGRIM HAT TYPE STRAINER WITH PERFORATED 1/8 INCH DIAMETER STAGGERED HOLES ON 3/16 INCH CENTERS. PERMANENTLY INSTALLED.
8. THE PCV CONTROL LINE CONNECTED TO A STRAIGHT RUN OF PIPE 3 TO 5 FEET DOWNSTREAM OF THE PCV. THE PCV TO HAVE 3 FEET OF STRAIGHT PIPE RUN ON BOTH SIDES OF THE VALVE.
9. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI SHEET DRAWINGS AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00001 REV 3. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-MGN-CXP-00027 AND 24590-PTF-MGN-M6S1-00036, -00037, AND -00038.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE).

Q

REV	DESCRIPTION	DRN	CHKD	REVIEWED	DATE
0	ISSUED FOR CONSTRUCTION SET NOT #6				7-21-08

REVISION HISTORY

PROJECT No. 24590
SIZE D
REV. 0
SHEET 1 OF 1

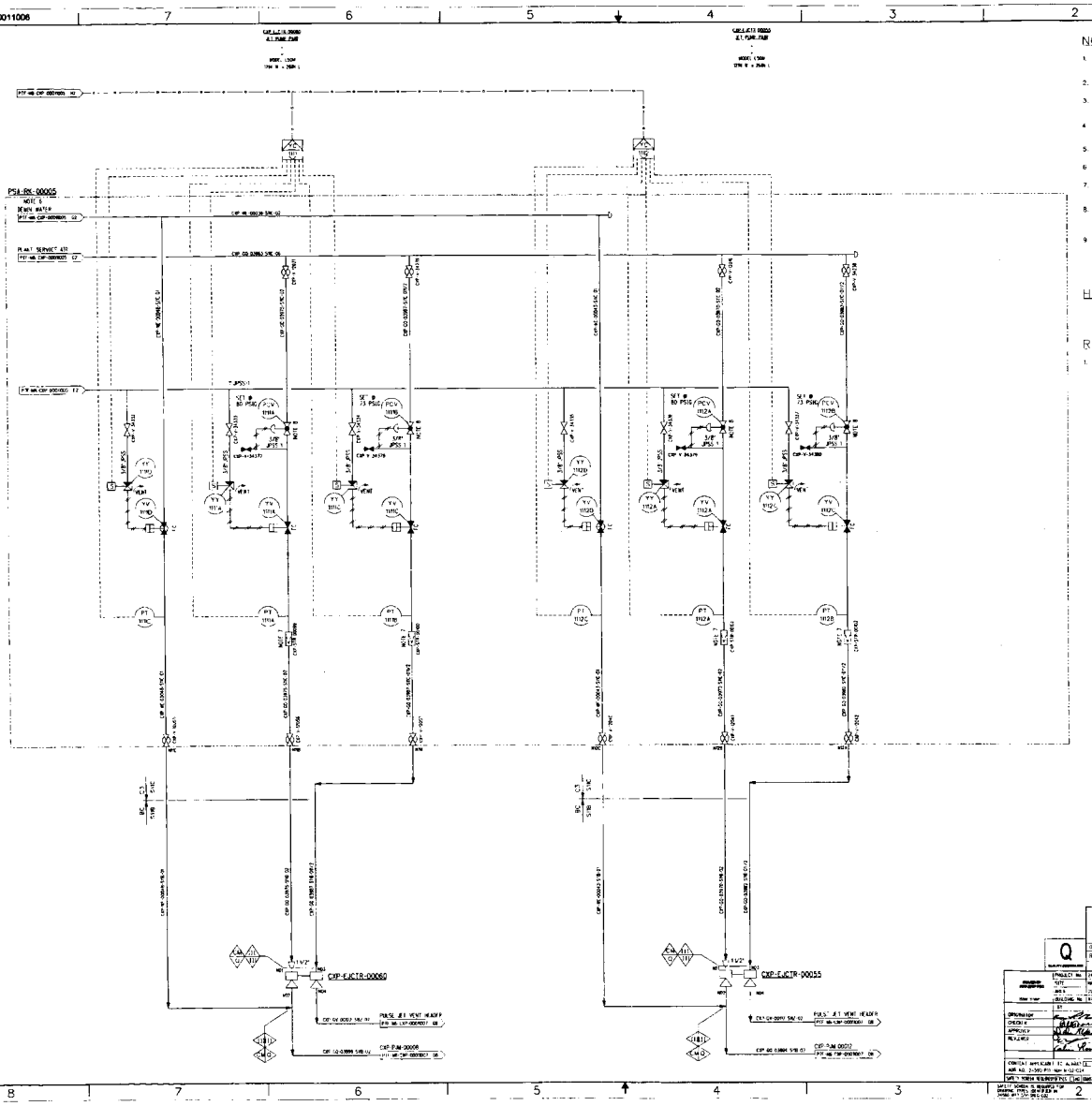
REVIEW PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM
UTILITY RACK
PSA-RK-00005

SCALE NONE
24590-PTF-M6-CXP-00011005
REV 0

24590-PTF-M6-CXP-00011006



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF-DRAINING, UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION, REFER TO DRAWING 24590-PTF-M6-CXP-00001R002.
6. SEE JET PUMP PAIR CONTROL DETAIL 2 ON DRAWING 24590-WTP-M6-S0-00008.
7. STRAINER IS A CONICAL PILGRIM HAT TYPE STRAINER WITH PERFORATED 1/8 INCH DIAMETER STAGGERED HOLES ON 3/16 INCH CENTERS, PERMANENTLY INSTALLED.
8. THE PCV CONTROL LINE CONNECTED TO A STRAIGHT RUN OF PIPE 3 TO 5 FEET DOWNSTREAM OF THE PCV. THE PCV TO HAVE 2 FEET OF STRAIGHT PIPE RUN ON BOTH SIDES OF THE VALVE.
9. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND, IN PART, SUPERSEDES 24590-PTF-M6-CXP-00001 REV. 5. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-CXP-00027, AND 24590-PTF-M6N-W001-00036, -00037, AND -00038.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE).

REV	DESCRIPTION	ORG	CHKD	REVIEWER	DATE
0	ISSUED FOR CONSTRUCTION SEE NOTE				7-21-08

REVISION HISTORY

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM
UTILITY RACK
PSA-RK-00005

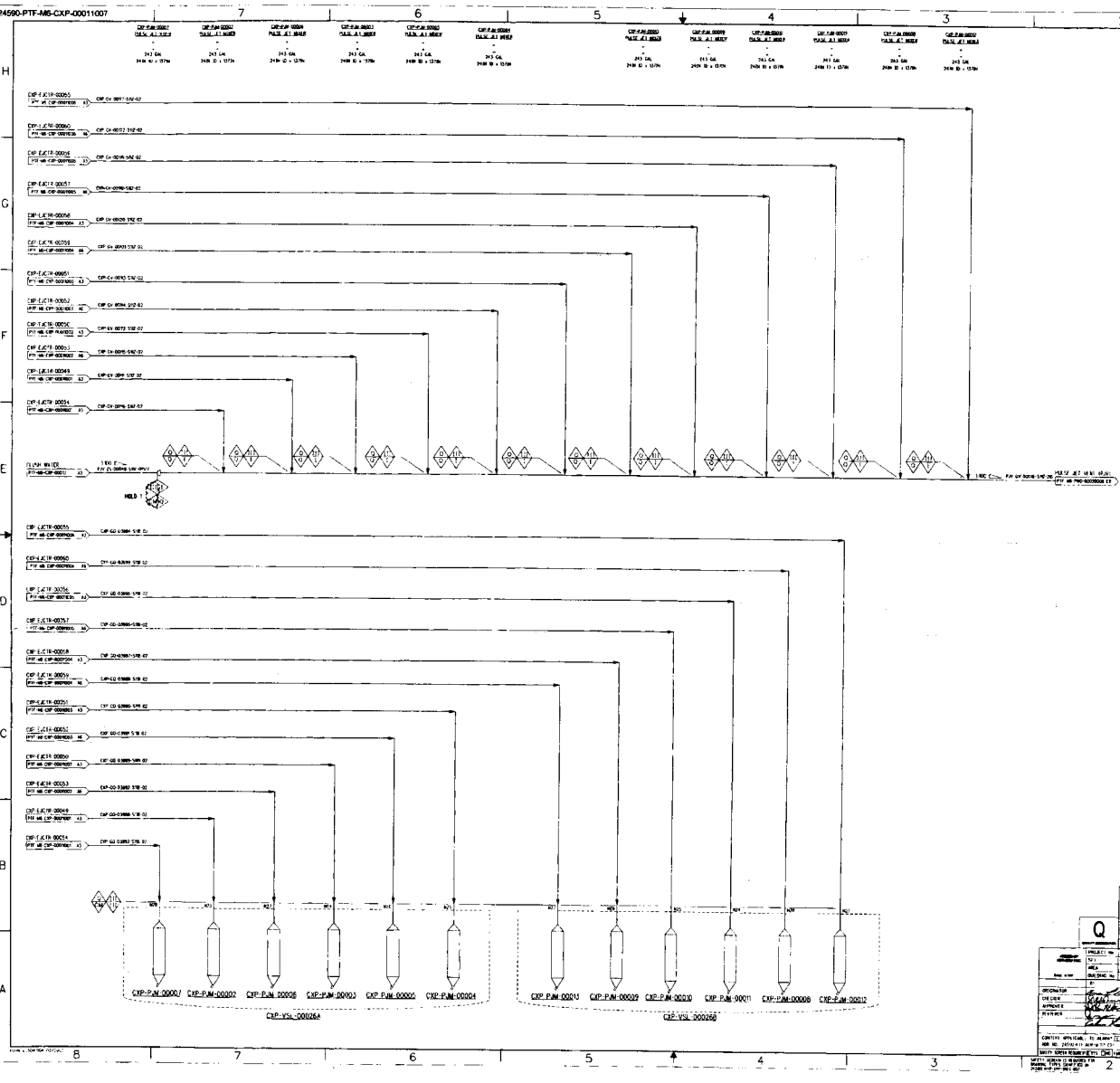
24590-PTF-M6-CXP-00011006 — REV 0

SCALE: NONE

SHEET 2 OF 2

CONTAINS BENEFICIAL INFORMATION. DO NOT DISTRIBUTE OUTSIDE CONTRACT WORK PERFORMED

24590-PTF-M6-CXP-00011007



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SCOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING, INCLUDING PULSE JET VENT LINES, IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED. ALL COMPONENTS SHOWN ARE INSIDE THE BLACK CELL (BC).
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE SELF DRAINING, UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION, REFER TO DRAWING 24590-PTF-M6-CXP-00010001, CXP-00010002.
6. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND IN PAR', SUPERSEDES 24590-PTF-M6-CXP-00011 REV 3. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-CXP-00027, 24590-M6N-M6D1-00037, AND -00038.

HOLD/OPEN ITEMS:

1. QUALITY DESIGNATION AND SEISMIC CLASSIFICATION ON HOLD PENDING APPROVAL OF AUTHORIZATION BASIS AMENDMENT REQUEST 24590-WTP-SE-ENS-08-011.

REFERENCES:

NONE

REV	DESCRIPTION	ORG	CHKD	REVIEW	APPR	DATE
Q	ISSUED FOR CONSTRUCTION SEE NOTE 4					7/6/09

REVISION HISTORY

RIVER PROTECTION PROJECT WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

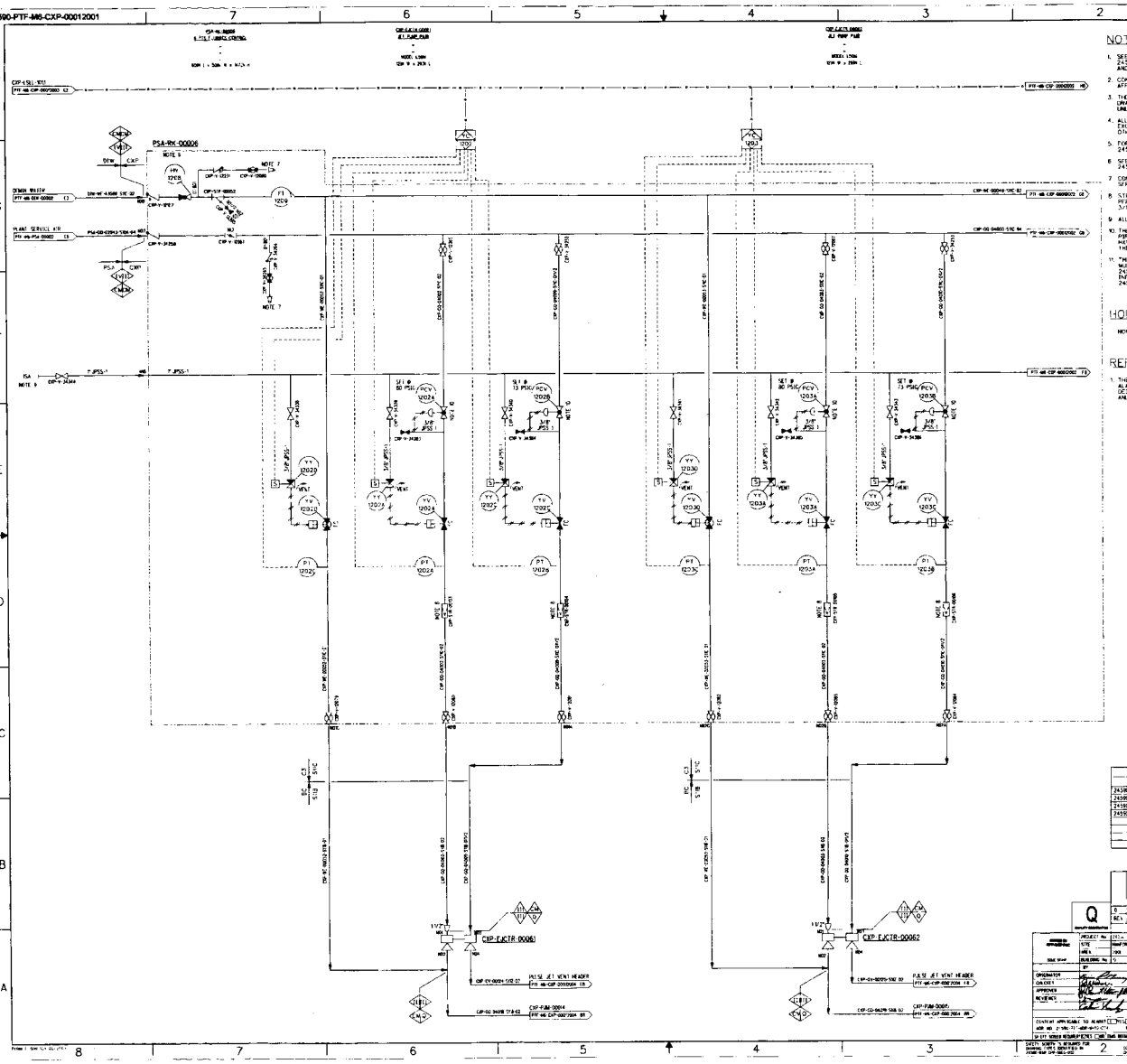
CONTRACT NO. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM VESSEL PJM
CXP-VSL-00026A/B

SIZE: D | 24590-PTF-M6-CXP-00011007 | REV: 0

SCALE: NONE

24590-PTF-M6-CXP-00012001



NOTES:

1. SEE DRAWINGS 24590-WTP-M5-S0-00001 THROUGH 24590-WTP-M5-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SCOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL: CM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF-DRAINING UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION, REFER TO DRAWING 24590-PTF-M6-CXP-00010003 (CXP-VSL-00026C).
6. SEE JET PUMP PAIR CONTROL DETAIL 2 ON DRAWING 24590-WTP-M5-S0-00006.
7. CONNECTION PROVIDED FOR REAGENTS, PLANT WASH AND SERVICE AIR.
8. STRAINER IS A CONICAL PLENUM HAT TYPE STRAINER WITH PERFORATED 1/8 INCH DIAMETER STAGGERED HOLES ON 3/16 INCH CENTERS, PERMANENTLY INSTALLED.
9. ALL TUBING OUTSIDE THE RACK TO BE 1/2 O.D. RUN.
10. THE PCV CONTROL LINE CONNECTED TO A STRAIGHT RUN OF PIPE 3 TO 5 FEET DOWNSTREAM OF THE HCV. THE PCV TO HAVE 3 FEET OF STRAIGHT PIPE RUN ON BOTH SIDES OF THE VALVE.
11. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI SHEET DRAWINGS AND IN PART SUPERSEDES 24590-WTP-M6-00001 AND 00002. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-CXP-00001, 00039, 24590-PTF-M6M-M001-00005, -00007, -00012, 00030, AND -00037.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM COST COMPANY (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE).

DRAWING INDEX	
DWG NO	TITLE
24590-PTF-M6-CXP-00012001	CXP SYSTEM UTILITY RACK PSA-RK-00006
24590-PTF-M6-CXP-00012002	CXP SYSTEM UTILITY RACK PSA-RK-00006
24590-PTF-M6-CXP-00012003	CXP SYSTEM UTILITY RACK PSA-RK-00006
24590-PTF-M6-CXP-00012004	CXP SYSTEM VESSEL PUMP CXP-VSL-00026C

REV	DESCRIPTION	DRG	CHKD	RVWD	APVD	DATE
0	ISSUED FOR CONSTRUCTION SEE NOTE 11					7-24-09

REVISION HISTORY

PROJECT No. 24590
SITE
AREA
BUILDING No. 0
DATE
ORIGINATOR
CHECKED
APPROVED
REVIEWED

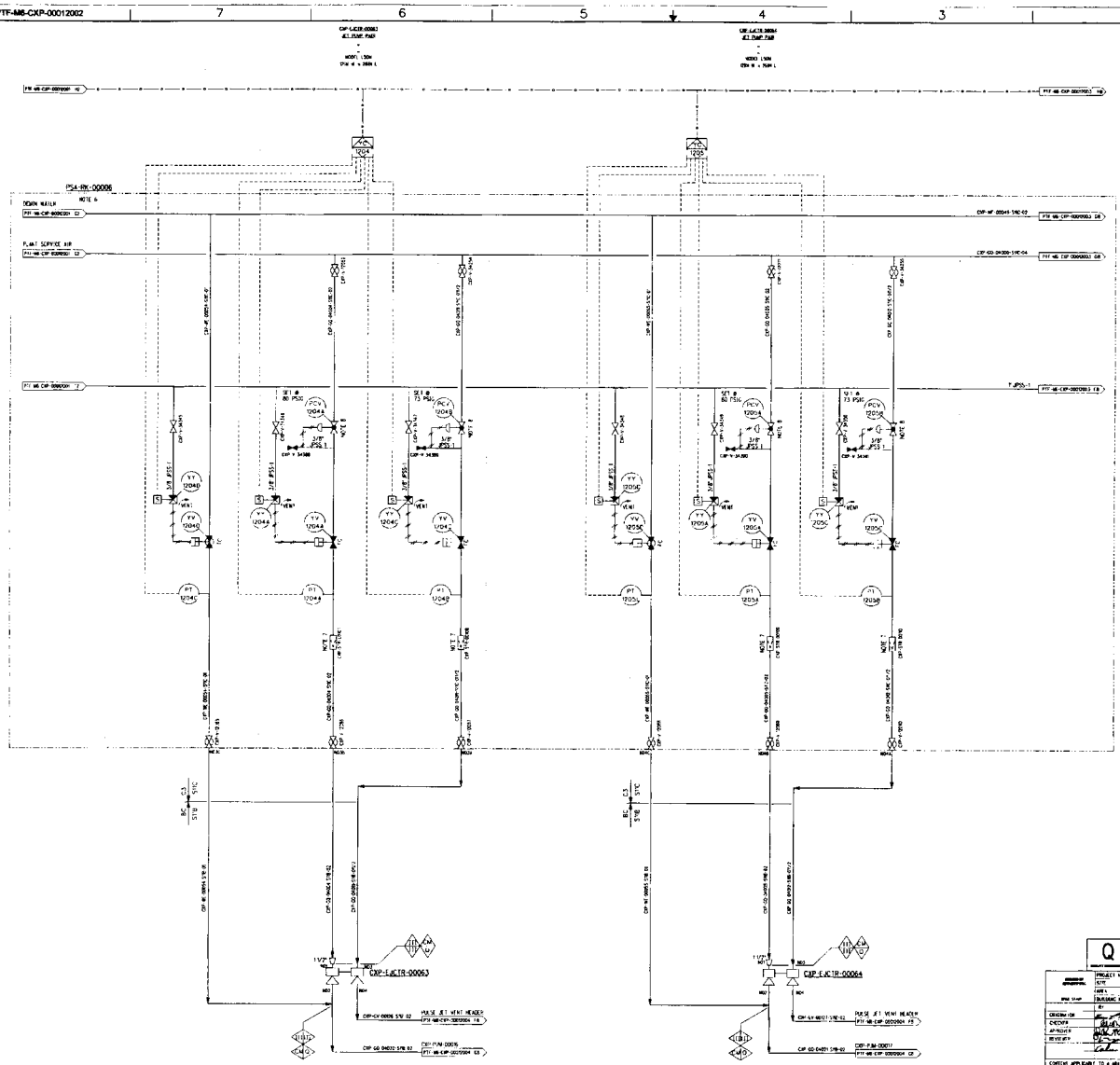
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE
PROCESS SYSTEM
UTILITY RACK
PSA-RK-00006

SCALE NONE
24590-PTF-M6-CXP-00012001
REV 0

24590-PTF-M6-CXP-00012002



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00006 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF DRAINING UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION REFER TO DRAWING 24590-PTF-M6-CXP-00010001 (CXP-VSL-00026C).
6. SEE JET PUMP PAIR CONTROL DETAIL 2 ON DRAWING 24590-WTP-M6-S0-00006.
7. STRAINER IS A CONICAL PILGRIM HAT TYPE STRAINER WITH PERFORATED 1/8 INCH DIAMETER STAGGERED HOLES ON 3/16 INCH CENTERS, PERMANENTLY INSTALLED.
8. THE PCV CONTROL LINE CONNECTED TO A STRAIGHT RUN OF PIPE (FITS 1 FITS 1 FITS) DOWNSTREAM OF THE PCV. THE PCV TO HAVE 3 FEET OF STRAIGHT PIPE RUN ON BOTH SIDES OF THE VALVE.
9. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWING, AND IN PART, SUPERSEDES 24590-PTF-M6-CXP-00012 REV 2. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-CXP-00021, -00031, 24590-PTF-M6N-M6D1-00005, -00007, -00012, 00036, AND -00037.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE).

REV	DESCRIPTION	DRC	CHKD	W/W/UP/VIC	DATE
0	ISSUED FOR CONSTRUCTION SEE NOTE 9				

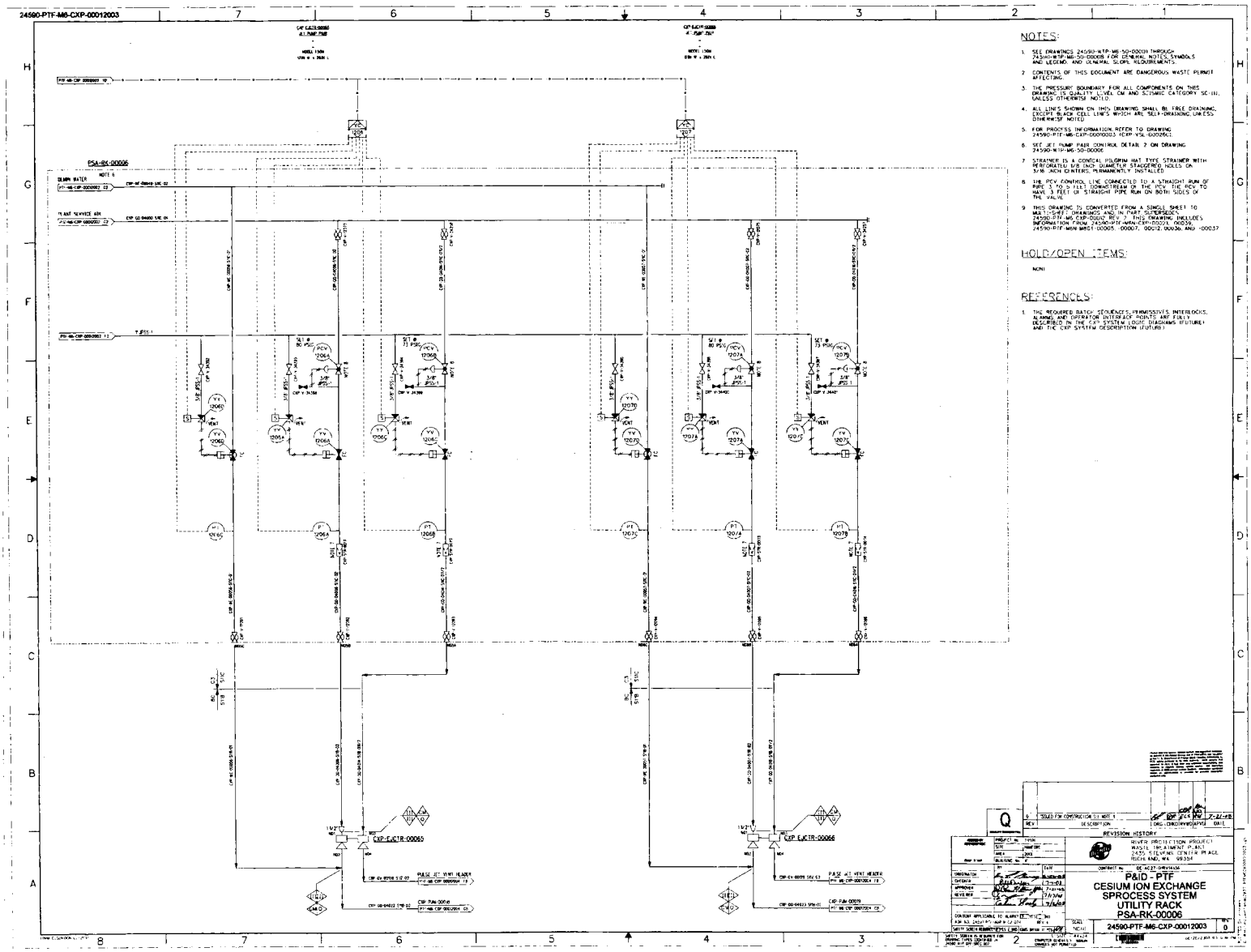
REVISION HISTORY

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT NO. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM UTILITY RACK PSA-RK-00006

24590-PTF-M6-CXP-00012002 REV 0



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF-DRAINING UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION, REFER TO DRAWING 24590-PTF-M6-CXP-00006003 (CXP VSL-00006A).
6. SEE JET PUMP PAIR CONTROL DETAIL 2 ON DRAWING 24590-WTP-M6-S0-00006.
7. STRAINER IS A CONICAL PERFORATED TYPE STRAINER WITH PERFORATED 1/8 INCH DIAMETER STAGGERED HOLES ON 3/16 INCH CENTERS, PERMANENTLY INSTALLED.
8. THE PCV CONTROL LINE CONNECTED TO A STRAIGHT RUN OF PIPE 3 TO 5 FEET DOWNSTREAM OF THE PCV. THE PCV TO HAVE 3 FEET OF STRAIGHT PIPE RUN ON BOTH SIDES OF THE VALVE.
9. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND IN PART SUPERSEDES 24590-PTF-M6-CXP-00003 REV. 7. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-MRN-CXP-00001, 00036, 24590-PTF-MRN-MRD1-00005, 00007, 00012, 00036, AND -00037.

HOLD/OPEN ITEMS:

NONE

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE).

REV	DESCRIPTION	DRG CHKD	INV'D	APV'D	DATE
0	ISSUED FOR CONSTRUCTION (SEE NOTE 1)				

REVISION HISTORY

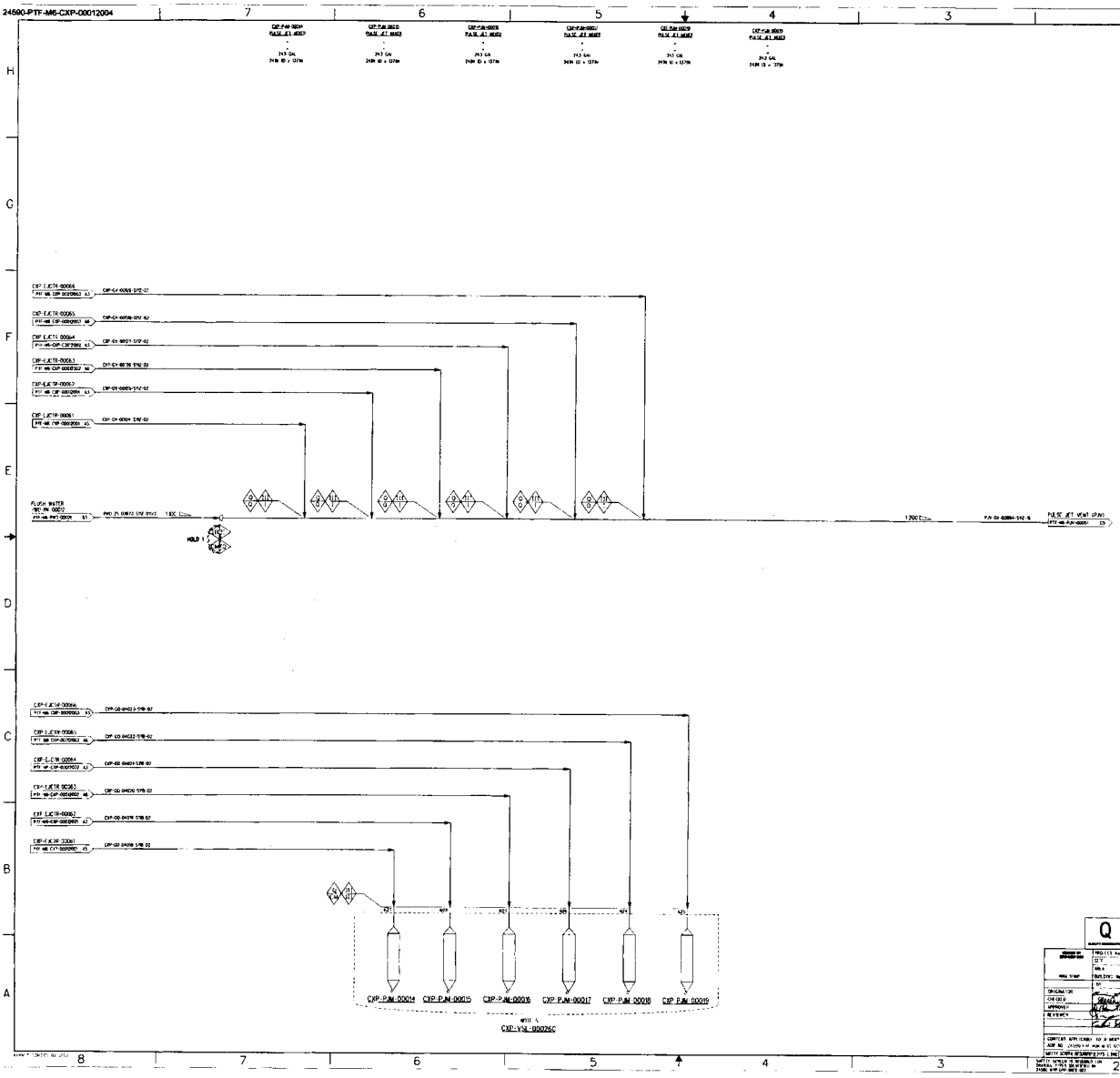
RIVER PROTECTION PROJECT
HANFORD SITE
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT NO. DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE SPROCESS SYSTEM UTILITY RACK PSA-RK-00006

24590-PTF-M6-CXP-00012003 REV 0

24590-PTF-M6-CXP-00012004



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
3. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING, INCLUDING PULSE JET VENT LINES, QUALITY LEVEL Q AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED. ALL COMPONENTS SHOWN ARE INSIDE THE BLACK CELL (BC).
4. ALL LINES SHOWN ON THIS DRAWING SHALL BE SELF DRAINING, UNLESS OTHERWISE NOTED.
5. FOR PROCESS INFORMATION, REFER TO DRAWING 24590-PTF-M6-CXP-00010003.
6. THIS DRAWING IS CONVERTED FROM A SINGLE SHEET TO MULTI-SHEET DRAWINGS AND IN PART, SUPERSEDES 24590-PTF-M6-CXP-00010 REV 2. THIS DRAWING INCLUDES INFORMATION FROM 24590-PTF-M6N-CXP-00021, -00039, 24590-PTF-M6N-M001-00030, -00037, 00012, 00036 AND -00037.

HOLD/OPEN ITEMS:

1. QUALITY DESIGNATION AND SEISMIC CLASSIFICATION ON HOLD PENDING APPROVAL OF AUTHORIZATION BASIS AMENDMENT REQUEST 24590-WTP-SE-ENG-08-001.

REFERENCES:

NONE

REVISION HISTORY

REV	DESCRIPTION	ORIG	CHKD	REVIEWED	DATE
2	ISSUED FOR CONSTRUCTION SEE NOTE 6				7-31-08

Q

WASHINGTON GROUP INTERNATIONAL

PROJECT No. 24590
CITY
GROUP
FACILITY PTF
SYSTEM/BLDG. No. 1

WASHINGTON GROUP INTERNATIONAL

WASTE TREATMENT PLANT
PAUL STEVENS CENTER (1) ACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

ORIGINATOR
CHECKER
APPROVER
REVIEWER

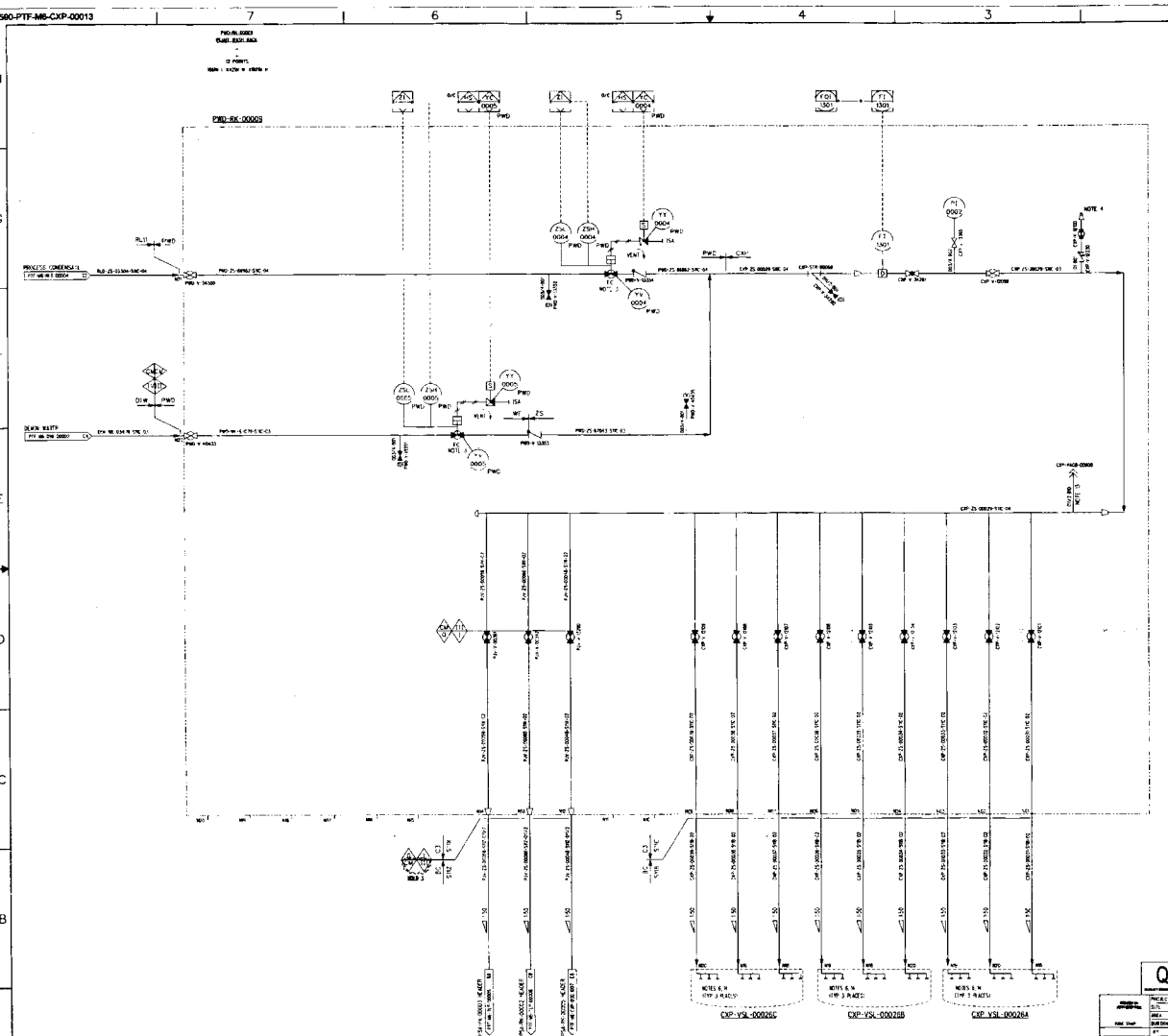
P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM VESSEL PJM CXP-VSL-00026C

SCALE: NONE

24590-PTF-M6-CXP-00012004

REV: 0

24590-PTF-M6-CXP-00013



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS
2. DELETED
3. VALVES INTERLOCKED TO PREVENT MULTIPLE VALVE OPERATION
4. CONNECTION PROVIDED FOR REAGENTS, PLANT WASH, AND SERVICE AIR
5. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING
6. FOR PROCESS INFORMATION, REFER TO DRAWING 24590-PTF-M6-CXP-00010 FOR CXP-VSL-00026A/B/C.
7-8. DELETED
9. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL QM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED
10. DELETED
11. INDICATED SLOPES ARE CONSIDERED MINIMUM.
12. ALL LINES ON THIS DRAWING SHALL BE FREE DRAINING, UNLESS OTHERWISE NOTED
13. BRANCH TO BE CONNECTED TO HORIZONTAL RUN OF HEADER PIPE.
14. PIPE ROUTING LIMITED TO MAXIMUM OF AN 8 FT STRAIGHT VERTICAL DROP AT THE CONNECTION TO THE VESSEL.
15. REVISION 1 SEE ARCHIVED REVISION 1 PWD FOR REVISION 1 CHANGES.
16. REVISION 2: MAJOR REVISION, NO REVISION CLOUDS REQUIRED. REVISED TO INCORPORATE 24590-PTF-MWH-MR01-00025, -00026 AND -00027. INCORPORATED AND FURTHER REVISED 24590-PTF-MWH-MR07-00007 AND 24590-PTF-MWH-CXP-00022 ADDED VACUUM BREAKER, VORTEX BREAKER, HIGH POINT VENT, AND DRAIN VALVE. CHANGED QUALITY LEVEL, SEISMIC CATEGORY, AND SLOPES. DELETED SPARES. REVISED/ADDED/DELETED NOTES, HOLDS AND REFERENCES

HOLD/OPEN ITEMS:

1-2. DELETED
3. QUALITY DESIGNATION AND SEISMIC CLASSIFICATION ON HOLD PENDING APPROVAL OF AUTHORIZATION BASIS AMENDMENT REQUEST 24590-WTP-SE-ENS-08-0011.

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CXP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CXP SYSTEM DESCRIPTION (FUTURE)

REV.	DESCRIPTION	DWN	CHKD	PE/PM	DE/APVD	DATE
2	REVISED PER NOTE 16					5/21/09
1	REVISED PER NOTE 15	RN	RK	DK	AJ	9/18/03
0	ISSUED FOR CONSTRUCTION	JR	AV	RS	PM	12/2/03

REVISION HISTORY

Q

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT NO DE-AC27-01RV14136

P&ID - PTF
CESIUM ION EXCHANGE PROCESS SYSTEM PLANT WASH RACK PWD-RK-00009

24590-PTF-M6-CXP-00013

REV 2

SCALE: NONE

SHEET 2

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Quarter Ending September 30, 2009

24590-PTF-PCN-ENV-09-003

Hanford Facility RCRA Permit Modification Notification Form

Part III, Operating Unit 10

Waste Treatment and Immobilization Plant

Index

Page 2 of 3: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant
Update PTF Piping and Instrumentation Diagrams (P&ID) for the PTF Cesium Nitric Acid Recovery Process (CNP) System Vessels, Rectifier, Condensers, and Utility Services in Appendix 8.2 of the Dangerous Waste Permit.

Submitted by Co-Operator:

D M Busche 8/18/09

D. M. Busche Date

Reviewed by ORP Program Office:

S. J. Olinger 9/23/09

S. J. Olinger Date

Quarter Ending September 30, 2009

24590-PTF-PCN-ENV-09-003

Hanford Facility RCRA Permit Modification Notification Form	
Unit: **Waste Treatment and Immobilization Plant**	Permit Part: **Part III, Operating Unit 10**

Description of Modification:

The purpose of this Class 1 prime modification is to update the following P&IDs for the PTF Cesium Nitric Acid Recovery Process System Vessels, Rectifier, Condensers, and Utility Services vessels and equipment. The following P&IDs are submitted to replace those currently in Appendix 8.2.

Appendix 8.2			
Replace:	24590-PTF-M6-CNP-P0001, Rev 0	With:	24590-PTF-M6-CNP-00001, Rev 2
	24590-PTF-M6-CNP-P0002, Rev 0	With:	24590-PTF-M6-CNP-00002, Rev 2
	24590-PTF-M6-CNP-P0004, Rev 0	With:	24590-PTF-M6-CNP-00004, Rev 3
	24590-PTF-M6-CNP-P0010, Rev 1	With:	24590-PTF-M6-CNP-00010, Rev 2

The referenced P&IDs have been revised. They incorporate changes provided in applicable document change forms (e.g., DCN, SCN, SDDR, FCN, FCR, etc.) and changes associated with the resolution to comments on change documents since the issuance of the last revision of the permitted drawing. This modification requests Ecology approval and incorporation into the permit, the specific changes to these P&IDs that are indicated by change history notes, clouds, and revision triangles. Revisions are the result of ongoing design changes. The following identifies the significant types of changes on the attached drawings:

24590-PTF-M6-CNP-00001

- Revised, deleted, and added new notes and references
- Note revised to indicate that the pressure boundary rather than all piping and equipment is classified as Quality Level "Q" and Seismic Category "I"; Valves YV-0125 and YV-0131 are also Quality Level "Q"
- Updated slope notations to specific lines
- Updated line slope indicators on lines CNP-PF-00020-S11B-03 (Cs Concentrate HLP-VSL-00027B via CNP-EJCTR-00004) (PTF-M6-HLP-00001), CXP-HR-000026-SIIB-02 (Cs Eluate CXP-IXC-00001/2/3/4) (PTF-M6-CXP-00003002) and CXP-HR-00079-SIIB-02 (Cs Eluate CXP-IXC-00001/2/3/4) (PTF-M6-CXP-00003002) to reflect correct slope and flow direction

The following is a list of outstanding change documents that have not been incorporated into this modification:

- 24590-PTF-M6N-M80T-00061
- 24590-PTF-M6PN-CNP-00001

24590-PTF-M6-CNP-00002

- Revised, deleted, and added new notes and references
- Note revised to state that wash rings are shown on drawing 24590-PTF-M6-CXP-00007 vs. 24590-PTF-M6-CNP-00005
- Note revised to indicate that the Pressure Boundary for all components on the drawing is Quality Level "CM" and Seismic Category "III" unless otherwise noted
- Updated slope notations to specific lines
- Removed reference to CNP-BULGE-00008. Note: CNP-BULGE-00008 is no longer included in plant design. All related piping and ancillary equipment will have secondary containment or be monitored through daily visual inspections
- Revised line number from CNP-PF-00017-S11B-03 to CNP-PF-00017-N31D-03; Line slope changed from 1:20 to 1:35
- Revised line number from CNP-PF-00028-S11B-03 to CNP-PF-00028-N31D-03; Line slope changed

Quarter Ending September 30, 2009

24590-PTF-PCN-ENV-09-003

from 1:20 to 1:35

The following is a list of outstanding change documents that have not been incorporated into this modification:

- None

24590-PTF-M6-CNP-00004

- Revised, deleted, and added new notes and references
- Hold Item added to indicate that a Quality Level designation and Seismic Category classification is on hold pending approval of Authorization Basis Amendment Request 24590-WTP-SE-ENS-08-0120
- Lines PJV-GV-02887-S11Z-12 (Pulse Jet Vent (PJV)) (PTF-M6-PJV-P0001) and PWD-ZS-03677-S11Z-02 (Plant Wash PWD-RK-00018) (PTF-M6-PWD-00034) locations flipped on drawing to bring in line with WTP standardized drawing layout for input and output flow indicators

The following is a list of outstanding change documents that have not been incorporated into this modification:

- 24590-PTF-M6N-10-00005
- 24590-PTF-M6N-M80T-00055
- 24590-PTF-M6PR-10-00002

24590-PTF-M6-CNP-00010

- Revised, deleted, and added new notes and references
- Note revised to indicate a connection will be provided for reagents, plant wash, and service air
- Note revised to indicate that the Pressure Boundary for all components on the drawing is Quality Level "Q" and Seismic Category "I" unless otherwise noted
- Added line CNP-ZH-00033-SIIC-02 (Mesh Spray/Wash CNP-EVAP-00001) (PTF-M6-CNP-00008)

The following is a list of outstanding change documents that have not been incorporated into this modification:

- 24590-PTF-M6PR-CNP-00001

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number: NA

Enter wording of WAC 173-303-830, Appendix I Modification citation:

In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class [1]1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Modification Approved/Concur: [X] Yes [ ] Denied (state reason below)

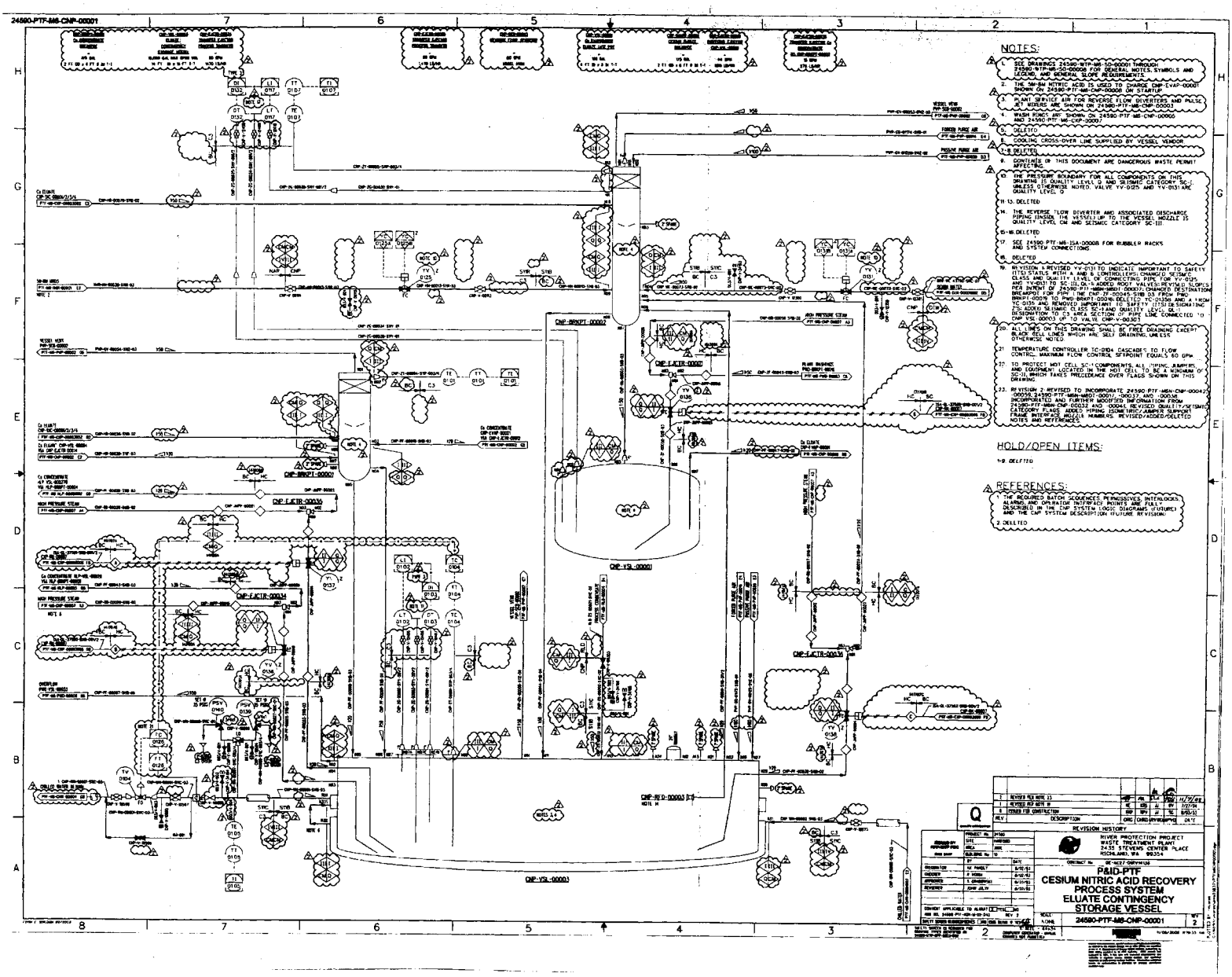
Reason for denial:

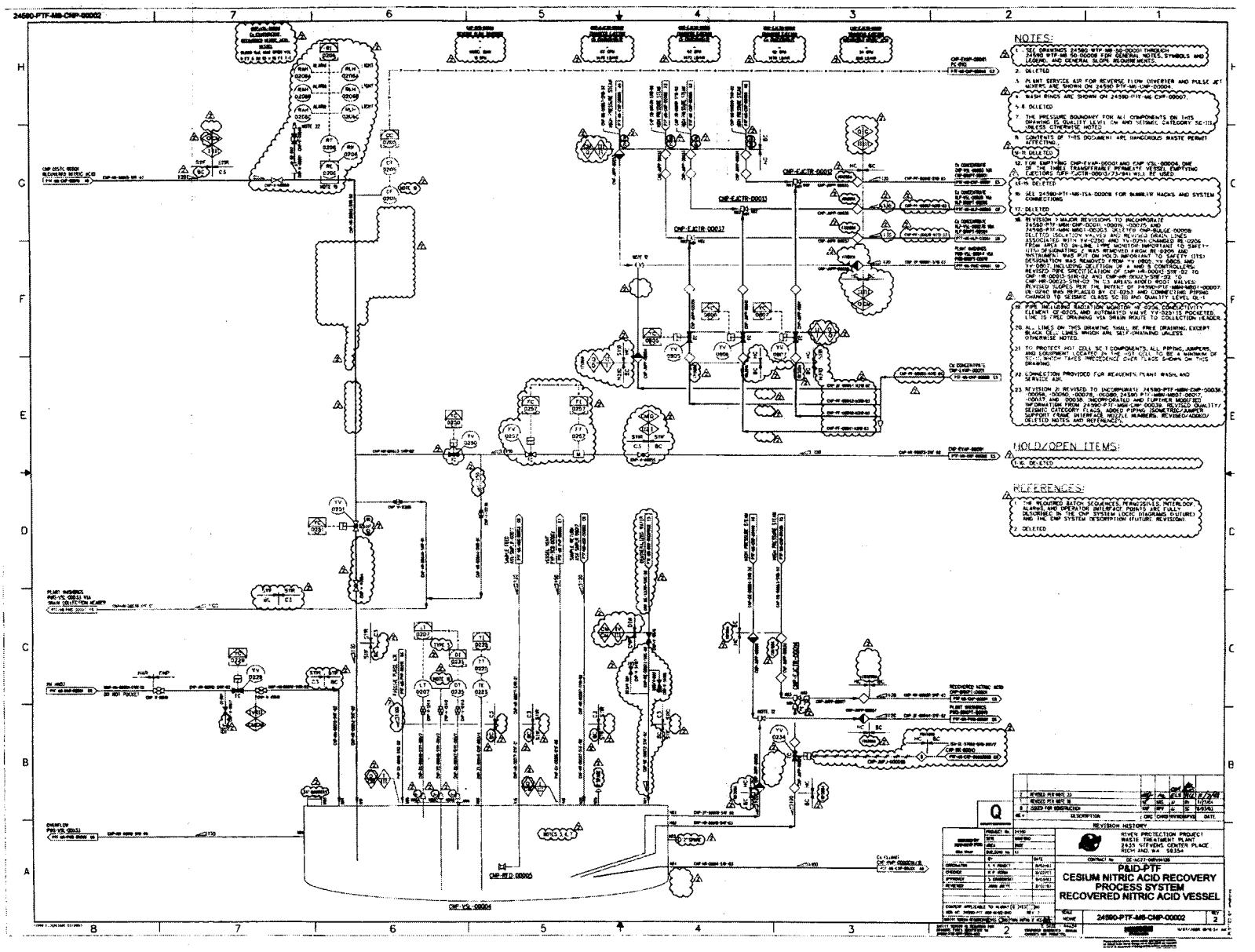
Reviewed by Ecology:

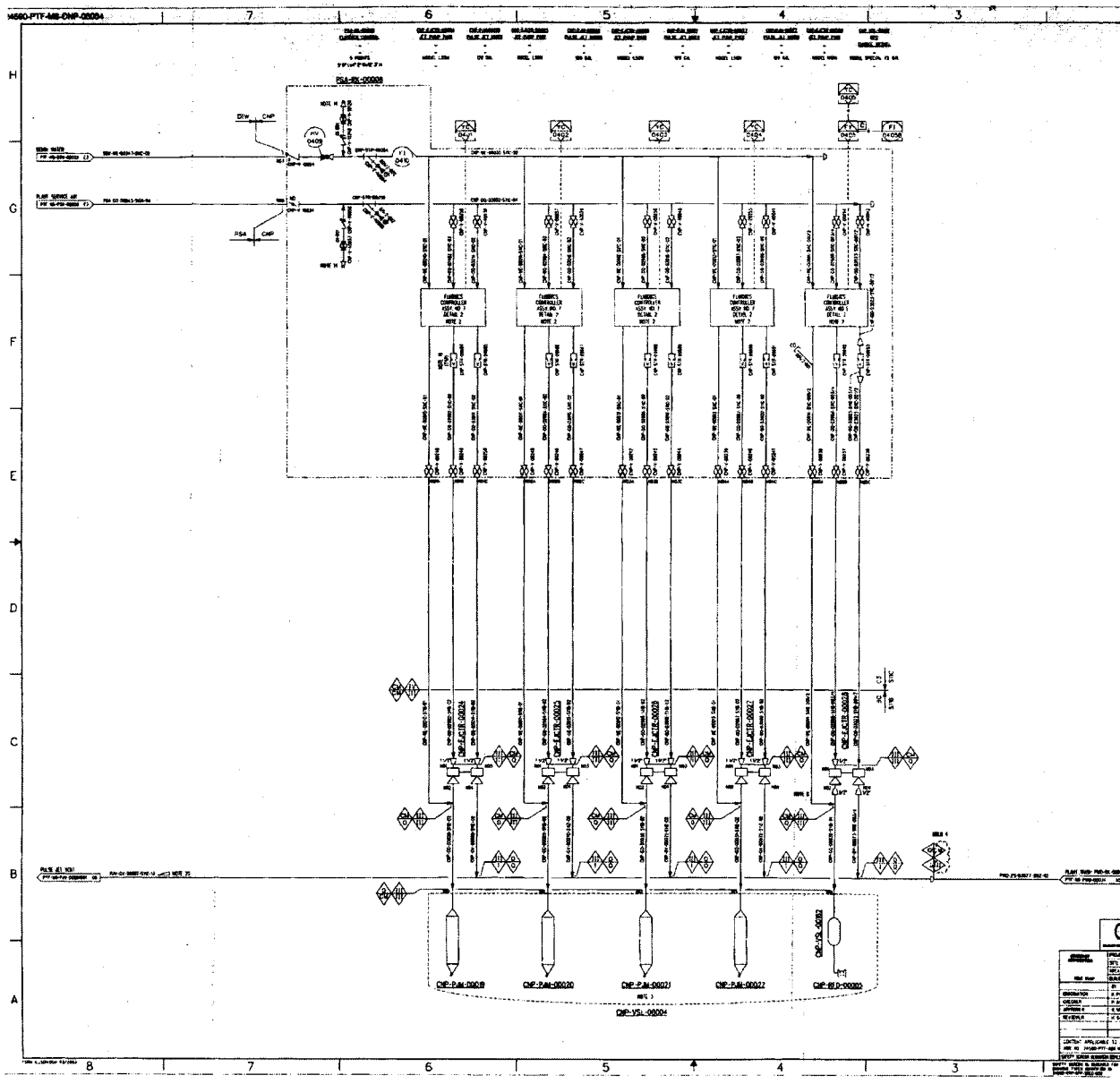
K. Elsethagen 10/16/09

~~Ed Fredenburg~~ Date

Kelly Elsethagen


24590-PTF-M6-CNP-00001
NOTES:
1. SEE DRAWINGS 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. THE 98-8N NITRIC ACID IS USED TO CHARGE CNP-EVAP-00001 SHOWN ON 24590-PTF-M6-CNP-00004 ON STARTUP.
3. PLANT SERVICE AIR FOR REVERSE FLOW DIVERTERS AND PULSE JET MIXERS ARE SHOWN ON 24590-PTF-M6-CNP-00003.
4. WASH RINGS ARE SHOWN ON 24590-PTF-M6-CNP-00003 AND 24590-PTF-M6-CNP-00007.
5. DELETED
6. COOLING CROSS-OVER LINE SUPPLIED BY VESSEL VENDOR.
7-9. DELETED
8. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
10. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL 2 AND SEISMIC CATEGORY SC-I, UNLESS OTHERWISE NOTED. VALVE YV-0125 AND YV-0131 ARE QUALITY LEVEL 3
11-13. DELETED
14. THE REVERSE FLOW DIVERTER AND ASSOCIATED DISCHARGE PIPING INSIDE THE VESSEL UP TO THE VESSEL NOZZLE IS QUALITY LEVEL QM AND SEISMIC CATEGORY SC-III.
15-16. DELETED
17. SEE 24590-PTF-M6-15A-00008 FOR BUBBLER WACKS AND SYSTEM CONNECTIONS.
18. DELETED
19. REVISION 1: REVISED YV-0131 TO INDICATE IMPORTANT TO SAFETY (ITS) STATUS WITH A AND B CONTROLLERS; CHANGED SEISMIC CLASS AND QUALITY LEVEL OF CONNECTING PIPE FOR YV-0125 AND YV-0131 TO SC-III, QL-3; ADDED ROOT VALVES; REVISED SLOPES PER ADDENDUM OF 24590-WTP-MRN-M607-00017; CHANGED DESTINATION OF PIPE CNP-DP-00045-S1B1 03 FROM PNO BRKPT-00009 TO PNO BRKPT-00008; DELETED YV-0125AB AND A HIGH YC-0135 AND REMOVED SEISMIC CLASS FROM YV-0131; DESIGNATING ITS ADDED SEISMIC CLASS SC-I AND QUALITY LEVEL QL-2; DESIGNATION TO C3 AREA SECTION OF PIPE LINE CONNECTED TO CNP VSL-00003 UP TO VALVE CNP-V-00301
20. ALL LINES ON THIS DRAWING SHALL BE FREE DRAINING EXCEPT BLACK CELL LINES WHICH ARE SELF DRAINING UNLESS OTHERWISE NOTED
21. TEMPERATURE CONTROLLER TC-0104 (CASCADE) TO FLOW CONTROL MAXIMUM FLOW CONTROL SETPOINT EQUALS 60 GPM.
22. TO PROTECT HOT CELL SC-I COMPONENTS, ALL PIPING, JUMPERS, AND EQUIPMENT LOCATED IN THE HOT CELL TO BE A MINIMUM OF SC-II, WHICH TAKES PRECEDENCE OVER FLAGS SHOWN ON THIS DRAWING.
23. REVISION 2: REVISED TO INCORPORATE 24590-PTF-MRN-CNP-00042, -00058, 24590-PTF-MRN-M607-00017, -00037, AND -00038 INCORPORATED AND FURTHER MODIFIED INFORMATION FROM 24590-PTF-MRN-CNP-00032 AND -00041. REVISED QUALITY/SEISMIC CATEGORY FLAGS, ADDED PIPING ISOMETRIC/JAMPER SUPPORT FRAME INTERFACE NOZZLE NUMBERS. REVISED/ADDED/DELETED NOTES AND REFERENCES.
HOLD/OPEN ITEMS:
1-9. DELETED
REFERENCES:
1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY ENGINEERED IN THE CNP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CNP SYSTEM DESCRIPTION (FUTURE REVISION).
2. DELETED
CNP-BRKPT-00007
CNP-EJCTR-0000
CNP-BRKPT-00001
CNP-EJCTR-00034
CNP-VSL-00001
CNP-EJCTR-00036
CNP-RED-00003
CNP-VSL-00003
REVISION HISTORY
REV 1 REVISED PER NOTE 23
REV 0 ISSUED FOR CONSTRUCTION
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354
P&ID-PTF
CESIUM NITRIC ACID RECOVERY
PROCESS SYSTEM
ELUATE CONTINGENCY
STORAGE VESSEL
24590-PTF-M6-CNP-00001
REV 2


24590-PTF-M8-CMP-00002
NOTES:
HOLD/OPEN ITEMS:
REFERENCES:
REVISION HISTORY
P&ID-PTF
CESIUM NITRIC ACID RECOVERY
PROCESS SYSTEM
RECOVERED NITRIC ACID VESSEL
24590-PTF-M8-CMP-00002



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00006 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. 3/4 JET PUMP PAIR CONTROL DETAIL ON LEGEND SHEET 24590-WTP-M6-50-00006
3. FOR PROCESS INFORMATION REFER TO PIPING AND INSTRUMENTATION DIAGRAM 24590-PTF-M6-CNP-00002.
4-5. DELETED
6. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
7. DELETED
8. A 45-DEGREE WYE PIPE FITTING SHALL BE USED AT THIS CONNECTION AND LOCATION.
9-13. DELETED
14. CONNECTION PROVIDED FOR REAGENTS, PLANT WASH, AND SERVICE AIR
15. DELETED
16. REVISION 2: INCORPORATED 24590-PTF-MSN-CNP-00003, 24590-PTF-MSN-MR01-00007, 24590-PTF-MSN-MR01-00008, 24590-PTF-MSN-MR01-00012, ADDED NOZZLE NUMBERS, REVISED NOTES 3 & 13 (REMOVED CHECK VALVE, ADDED NOTE 15 AND REVISED QUALITY/SEISMIC CLASSIFICATION, DELETED COMPONENT IDENTIFIER FOR SPECIALTY ITEM.
17. DELETED
18. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-IV, UNLESS OTHERWISE NOTED.
19. STRAINER IS A CONICAL PERFORM HAT TYPE STRAINER WITH PERFORATED 1/8 INCH DIAMETER STAGGERED HOLES ON 3/16 INCH CENTERS. PERMANENTLY INSTALLED UPSTREAM OF THE FLAMGEC VALVE.
20. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF-DRAINING, UNLESS OTHERWISE NOTED.
21. REVISION 3: MAJOR REVISION, NO REVISION CLOUDS REQUIRED. INCORPORATED 24590-PTF-MSN-CNP-00049, 24590-PTF-MSN-MR01-00036, -00037, -00038, AND FURTHER REVISED. REVISED QUALITY /SEISMIC CATEGORY FLAGS. ADDED/DELETED/REVISED NOTES AND HOLDS.

HOLD/OPEN ITEMS:

1-3. DELETED
4. QUALITY LEVEL DESIGNATION AND SEISMIC CATEGORY CLASSIFICATION ON HOLD PENDING APPROVAL OF AUTHORIZATION BASIS AMENDMENT REQUEST 24590-WTP-SE-08-0120 (FUTURE).

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CNP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CNP SYSTEM DESCRIPTION (FUTURE REVISION)

REV	DESCRIPTION	DRC	CHKD	RVWD	APVD	DATE
3	REVISED PER NOTE 21	RJT	JPP	KLF	MAF	10/15/03
2	REVISED PER NOTE 16	JR	SV	JG	RV	07.06
1	ISSUED FOR CONSTRUCTION	MAF	KL	VS	SV	07.16.02

REVISION HISTORY

PROJECT NO. 24590
DESIGNED SCL
DRAWN BAK
CHECKED
DRAWING No. 3

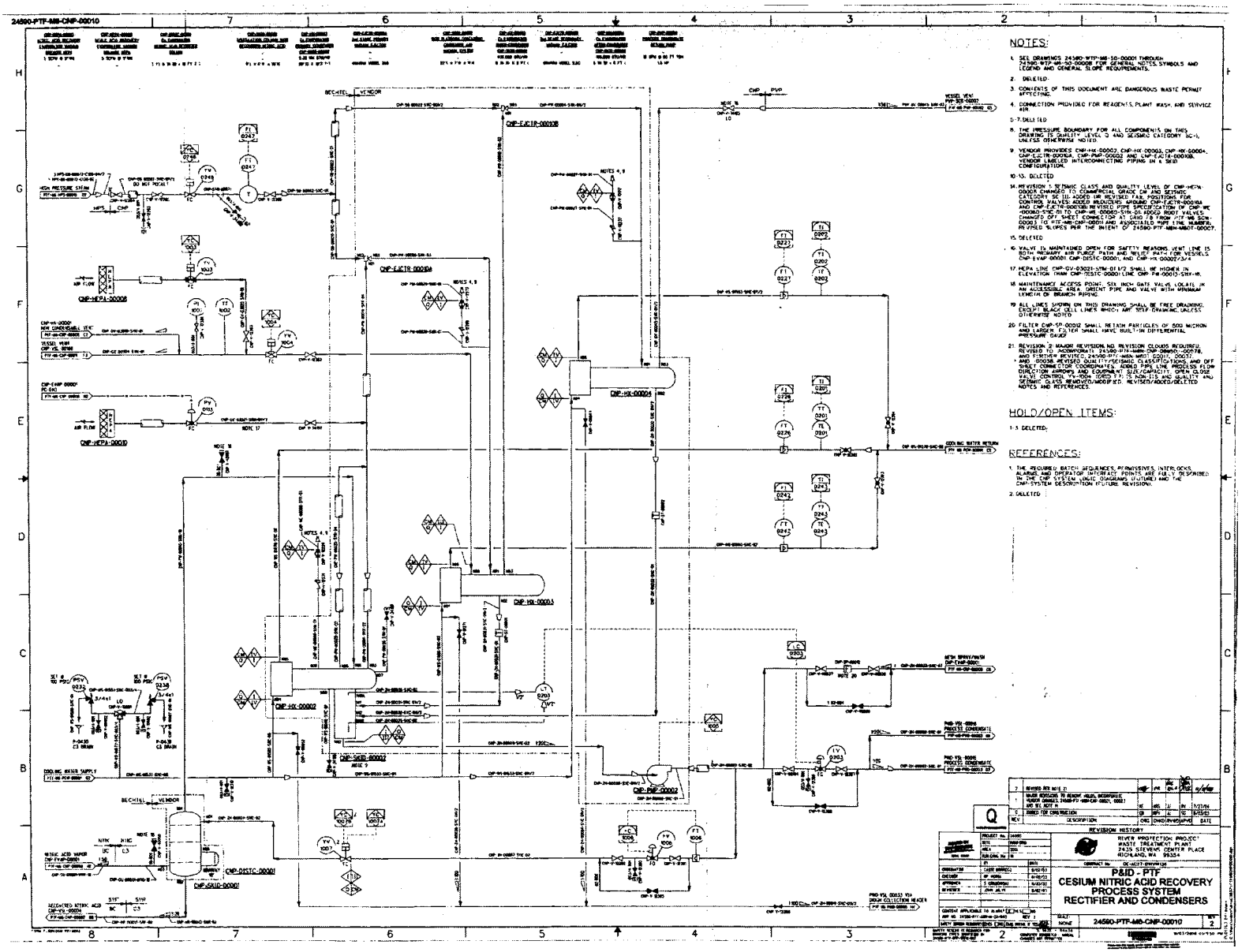
REVISED PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM NITRIC ACID RECOVERY UTILITY SERVICES - PSA RACK

24590-PTF-M6-CNP-00004 REV 3

SCALE: NONE


24590-PTF-M6-CNP-00010
NOTES:
1. SEE DRAWINGS 24590-WTP-M6-SD-00001 THROUGH 24590-WTP-M6-SD-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND AND GENERAL SLOPE REQUIREMENTS.
2. DELETED
3. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
4. CONNECTION PROVIDED FOR REAGENTS, PLANT WASH AND SERVICE AIR.
5-7. DELETED
8. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-I, UNLESS OTHERWISE NOTED.
9. VENDOR PROVIDES CNP-HX-00002, CNP-HX-00003, CNP-HX-00004, CNP-EJCTR-00004, CNP-PNP-00002 AND CNP-EJCTR-00008. VENDOR LABELED INTERCONNECTING PIPING IN A SKID CONFIGURATION.
10-13. DELETED
14. REVISION 1 SEISMIC CLASS AND QUALITY LEVEL OF CNP-HEPA-00008 CHANGED TO COMMERCIAL GRADE CM AND SEISMIC CATEGORY SC III. ADDED LIN REVISED FAIL POSITIONS FOR CONTROL VALVES. ADDED MUNCHENS AROUND CNP-EJCTR-00010A AND CNP-EJCTR-00010B. REVISED PIPE SPECIFICATION OF CNP-WC-00080-SS-PT.TO. CNP-HX-00060-SHK-06 ADDED ROOT VALVES. CHANGED CNP-SHEET-00001 TO SHEET 1 OF 2 AND ADDED SHEET 2 OF 2. ADDED CNP-EJCTR-00008 AND ASSOCIATED PIPE LINE NUMBERS. REVISED SLOPES PER THE INTENT OF 24590-WTP-M6N-M001-00007.
15. DELETED
16. VALVE IS MAINTAINED OPEN FOR SAFETY REASONS. VENT LINE IS BOTH PRIMARY AIR PURGE PATH AND RELIEF PATH FOR VESSELS CNP-EVAP-00001, CNP-DISTC-00001, AND CNP-HX-00002/3/4.
17. HEPA LINE CNP-RV-03021-STM-01.1/2 SHALL BE HIGHER IN ELEVATION THAN CNP-DISTC-00001 LINE CNP-PH-00015-SHK-HR.
18. MAINTENANCE ACCESS POINT. SIX INCH GATE VALVE ISOLATE IN AN ACCESSIBLE AREA. ORIENT PIPE AND VALVE WITH MINIMUM LENGTH OF BRANCH PIPING.
19. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING EXCEPT BLACK CELL LINES WHICH ARE SELF DRAINING, UNLESS OTHERWISE NOTED.
20. FILTER CNP-SP-00012 SHALL RETAIN PARTICLES OF 500 MICRON AND LARGER. FILTER SHALL HAVE BUILT-IN DIFFERENTIAL PRESSURE GAUGE.
21. REVISION 2 MAJOR REVISION NO REVISION CLOUDS REQUIRED. REVISED TO INCORPORATE 24590-WTP-M6N-CNP-00050-00078, AND 5 WITHIN REVISED 24590-WTP-M6N-M001-00017, 00037, AND 00038. REVISED QUALITY/SEISMIC CLASSIFICATIONS, AND OFF PAGE CONNECTIONS. ADDED EQUIPMENT, SEAL/CAN LINE PROCESS FLOW DIRECTION, APPROVE EQUIPMENT, SEAL/CAN LINE OPEN/CLOSE VALVE CONTROL, V4-4004 (CODE) 71 (CODE 71) ADDED SEISMIC CLASS REMOVED/MODIFIED. REVISED/ADDED/DELETED NOTES AND REFERENCES.
HOLD/OPEN ITEMS:
1-3. DELETED.
REFERENCES:
1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CNP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CNP SYSTEM DESCRIPTION (FUTURE REVISION).
2. DELETED
REVISION HISTORY
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354
P&ID - PTF
CESIUM NITRIC ACID RECOVERY
PROCESS SYSTEM
RECTIFIER AND CONDENSERS
24590-PTF-M6-CNP-00010
CNP-EJCTR-00008
CNP-EJCTR-00004
CNP-HEPA-00008
CNP-HEPA-00010
CNP-HX-00004
CNP-HX-00003
CNP-HX-00002
CNP-SKID-00002
CNP-PNP-00002
CNP-DISTC-00001
CNP-SKID-00001
BECHTEL
VENDOR
DOOSIN BIC WATER RETURN
COOLING WATER SUPPLY
VESSEL VENT
PROCESS CONDENSATE
NITRIC ACID VAPOR
DRAIN COLLECTION HEADER

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Quarter Ending September 30, 2009

24590-PTF-PCN-ENV-09-006

Hanford Facility RCRA Permit Modification Notification Form

Part III, Operating Unit 10

Waste Treatment and Immobilization Plant

Index

Page 2 of 2: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant Update PTF General Arrangement Plan for the 56' elevation in Appendix 8.4 of the Dangerous Waste Permit.

Submitted by Co-Operator:

Donna Busche 8/25/09

D. M. Busche Date

Reviewed by ORP Program Office:

SJ Olinger 8/12/09

S. J. Olinger Date

Quarter Ending September 30, 2009

24590-PTF-PCN-ENV-09-006

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part:
Waste Treatment and Immobilization Plant	**Part III, Operating Unit 10**

Description of Modification:

The purpose of this Class 1 modification is to update PTF General Arrangement Plan for the 56' elevation in Appendix 8.4 of the Dangerous Waste Permit. The following General Arrangement Drawing is submitted to replace the permitted General Arrangement Drawing currently in Appendix 8.4.

Appendix 8.4			
Replace:	24590-PTF-P1-P01T-00003, Rev. 3	With:	24590-PTF-P1-P01T-00003, Rev. 4

This modification requests Ecology approval and incorporation into the permit the specific changes to the General Arrangement Drawing identified by revision note 4 listed at the end of the note column, clouds, and revision triangles shown on the General Arrangement Drawing that has been issued since the last revision of the permit version. Revisions are the result of ongoing design. The following identifies the significant types of changes on the attached drawing:

- Incorporated DCNs identified in revision note 4
- Addition of UFP bulges - UFP-BULGE-00005/6
- Revised component locations and updated component information
- Added bulges, racks, pumps, and condensers
- Added curbing
- Added, modified, and deleted notes and holds

The following is a list of outstanding change documents that have not been incorporated into this modification:

- 24590-PTF-P1N-P01T-00124
- 24590-PTF-P1N-P01T-00130
- 24590-PTF-P1N-P01T-00131

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number:

Enter wording of WAC 173-303-830, Appendix I Modification citation: In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class [1]1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Modification Approved/Concur: [X] Yes [ ] Denied (state reason below)

Reason for denial:

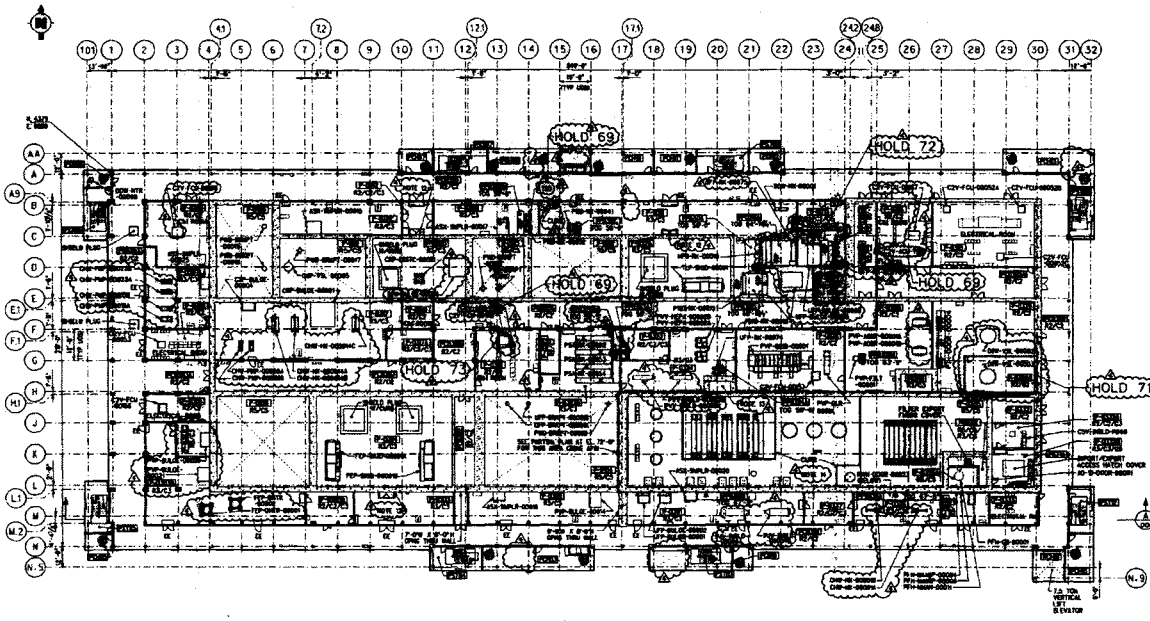
Reviewed by Ecology:

Kelly Elsethagen 11-24-2009

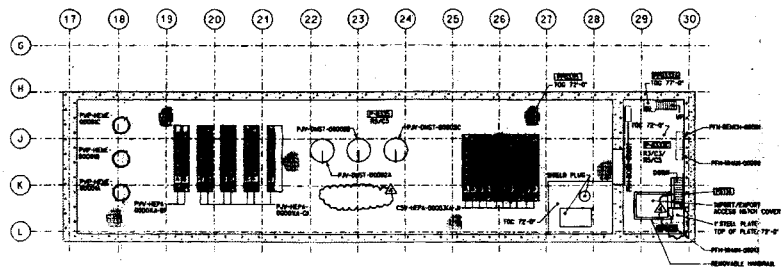
~~Ed Fredenburg~~ Date

Kelly Elsethagen

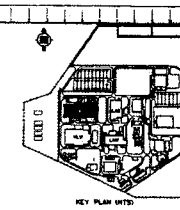
24590-PTF-P1-P01T-00003



PLAN AT EL. 56'-0"



PARTIAL PLAN AT EL. 72'-0"



KEY PLAN (NTS)

GENERAL NOTES:

1. FOR REFERENCE, SEE PLOT PLAN DRAWING No. 24590-WTP-PI-G0-00001.
2. ALL OPERATING AREAS ARE DESIGNATED R2/C2 UNLESS NOTED OTHERWISE.
3. ALL SUB-CHANGE ROOMS ARE DESIGNATED R3/C3/C3 UNLESS NOTED OTHERWISE.
4. DELETED
5. REFER TO DRAWING No. 24590-WTP-C2-C02T-00002 FOR CONVERSIONS FROM PT FACILITY 3D SITE ELEVATIONS. PT FACILITY ELEVATION 0'-0" EQUALS SITE ELEVATION 676'-6" ABOVE SEA LEVEL.
6. DELETED
7. FOR ROOM NUMBERS AND DESCRIPTIONS REFER TO DWG No. 24590-PTF-PI-P23T-00001. ROOMS ARE OFFICIALLY IDENTIFIED BY ROOM NUMBERS ONLY. ROOM NUMBERS ARE ESTABLISHED AND CONTROLLED ON GENERAL ARRANGEMENT AND ASSOCIATED EQUIPMENT LOCATION DRAWINGS. ONLY ROOM NUMBERS ARE NEEDED TO IDENTIFY ROOMS ON ENGINEERING DISCIPLINE DOCUMENTS. WHILE ROOM NUMBERS ARE CONTROLLED, THE MOST COMMON NAME OF ROOMS ASSOCIATED WITH EACH ROOM NUMBER IS SHOWN FOR REFERENCE ONLY ON ARCHITECTURAL FLOOR PLANS.
8. CONTENTS OF THIS DOCUMENT ARE HAZARDOUS WASTE PERMIT AFFECTING.
9. REFER TO PRETREATMENT FACILITY/ANNEX EQUIPMENT LOCATION INDEX KEY PLAN DRAWING No. 24590-PTF-PI-P23T-00004 LISTING AREA dimensions that PROVIDE A MORE DETAILED IDENTIFICATION OF EQUIPMENT.
10. DELETED.
11. FOR RADIOLOGICAL CLASSIFICATION REFER TO DOCUMENT No. 24590-WTP-GPP-RAD-002.
12. DOOR OPENING IN GYPSUM WALLBOARD PARTITION W/CURB AT BASE.
13. OPENING IS DEFERRED AT EL. 84'-0".
14. AREA CONTAINS BY CURBS SHALL BE LINED AND SLOPED TO OPENINGS. SLOPE SHALL BE NO LESS THAN 1%, INCLUDING CONSTRUCTION TOLERANCE.

LEGEND:

CA	CONTROLLED ACCESS
EE	EMERGENCY EXIT
FD	FIRE DOOR
TOC	TOP OF CONCRETE
TOG	TOP OF GRATING
R-#	ROOMS/CELLS/TUNNELS
A-#	ANNEX/CONTROL BUILDING NUMBERING
C-#	CORRIDORS & CONNECTING VESTIBULES
CH-#	CHASES
M-#	MEZZANINES
S-#	STAIRS
	EQUIPMENT REMOVAL/LAY DOWN AREA
	OPENING
	CONCRETE
	EMERGENCY SHOWER/EYEWASH (PLAN VIEW)
	EMERGENCY SHOWER/EYEWASH (ELEVATION VIEW)
	GRATING
	GYPSUM WALLBOARD
	GYPSUM WALLBOARD W/CURB AT BASE

HOLDS:

69. DELETED
70. DELETED
71. DELETED
72. DELETED
73. PENDING CONFIRMATION OF CTM's FROM D&I AND MS.
70. DELETED
71. PENDING FINAL LOCATION OF DIW VESSELS.
72. PENDING FINAL BOUNDING DIMENSIONS OF THE UFP BULGES.
73. PENDING FINAL LAYOUT OF STEEL AT EL. 66'-6".

REVISION 4 NOTE:

1. INCORPORATED DCN's 24590-PTF-PM-P01T-00101, 24590-PTF-PM-P01T-00108, 24590-PTF-PM-P01T-00110, 24590-PTF-PM-P01T-00112, 24590-PTF-PM-P01T-00115, 24590-PTF-PM-P01T-00118, 24590-PTF-PM-P01T-00119, 24590-PTF-PM-P01T-00120, 24590-PTF-PM-P01T-00121, 24590-PTF-PM-P01T-00122.
2. RELOCATED PVP-MB8B-00001A&B, FSP-DH1R-00901 AND PVP-DMLD-00023A&B.
3. DELETED NOTE 6. MODIFIED NOTES 5 AND 7. ADDED NOTES 13, 13 AND 14.
4. ADDED HOLDS 72 AND 73.
5. RELOCATED DHS-PAP-00009A&B. ADDED CHW-PAP-00002A&B, CHW-PAP-00003A&B AND CHW-HX-00001A,B&C.
6. REVISED CTM PHP-SK-00021TO UPF-RK-00075, PVP-RK-00022 TO UPF-RK-00078.
7. ADDED UFP-BULGE-00005, UFP-BULGE-00006, CZV-FCU-00166, CZV-FCU-00167 AND CZV-FCU-00168.
8. ADDED (2) CZV-ACU-780, CTM ON HOLD.
9. REMOVED PP03TB.
10. ADDED SYMBOLOGY DENOTING GYPSUM WALLBOARD W/CURB AT BASE.
11. REMOVE POND CLASSIFICATION.
12. ADDED CURB AT COLUMN LINE B/G.

REV	DESCRIPTION	DRN	CHKD	RVWD	APVD	DATE
4	SEE REVISION NOTE 4 AT DWG ZONE C/2	DJK	STC	LB		10/24/06
3	SEE REVISION NOTE 3 AT DWG ZONE C/2	GKC	DJ	KRC	KRJ	9/27/06
2	SEE REVISION NOTE 2 AT DWG ZONE C/2	EI	FA	GRC	RV	8/08-7/06
1	SEE REVISION NOTE 1 AT DWG ZONE C/2	FA	RV	JM	SS	10/6/03
0	ISSUED FOR DESIGN	FA	MC	SS	RV	5/3/03

REVISION HISTORY

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

PRETREATMENT FACILITY GENERAL ARRANGEMENT PLAN AT EL. 56'-0"

SCALE: 1"=20'-0"

24590-PTF-P1-P01T-00003

REV 4

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Quarter Ending 12/31/2009 24590-PTF-PCN-ENV-09-009

Hanford Facility RCRA Permit Modification Notification Form

Part III, Operating Unit 10

Waste Treatment and Immobilization Plant

Index

Page 2 of 3: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant
Update PTF Cesium Nitric Acid Recovery Process System (CNP) Piping and Instrumentation Diagram drawings for Plant Service Air (PSA) Rack, Plant Wash Rack, and CNP Rectifier and Condensers in Appendix 8.2 of the Dangerous Waste Permit.

Submitted by Co-Operator:

for DBusche 9/25/09

D. M. Busche Date

BTAllen

Reviewed by ORP Program Office:

10/14/09

G. A. Girard Date

Quarter Ending 12/31/2009 24590-PTF-PCN-ENV-09-009

Hanford Facility RCRA Permit Modification Notification Form	
Unit: **Waste Treatment and Immobilization Plant**	Permit Part: **Part III, Operating Unit 10**

Description of Modification:

The purpose of this Class 1 prime modification is to update the following P&IDs for the CNP PSA Rack, Plant Wash Rack, and CNP Rectifier and Condensers. The following source P&IDs are submitted to replace those currently in Appendix 8.2.

Appendix 8.2			
Replace:	24590-PTF-M6-CNP-P0003, Rev. 0	With:	24590-PTF-M6-CNP-00003, Rev. 3
	24590-PTF-M6-CNP-P0005, Rev. 0		24590-PTF-M6-CNP-00005, Rev. 2
	24590-PTF-M6-CNP-P0010, Rev. 1		24590-PTF-M6-CNP-00010, Rev. 2

The referenced P&IDs have been revised. They incorporate changes provided in applicable document change forms (e.g., DCN, SCN, SDDR, FCN, FCR, etc.) and changes associated with the resolution to comments on change documents since the issuance of the last revision of the permitted drawing. This modification requests Ecology approval and incorporation into the permit, the specific changes to these P&IDs that are indicated by notes. Revisions are the result of ongoing design changes. The following identifies the significant types of changes on the attached drawings.

24590-PTF-M6-CNP-00003

- Added some instrumentation and equipment specifications (capacities and model numbers)
- Revised demineralized water, plant service air, and pulse jet ventilation air piping
- Added an additional service air supply line, associated valves, and instrumentation
- Added and/or revised quality levels and seismic categories
- Revised nozzle numbers
- Editorial revisions to notes 1 and 12
- Deleted notes 4, 5, 7, 9, 13, 14, 15, and 16
- Added notes 8, 17, and 19 through 23
- Added hold 4
- Added a reference

24590-PTF-M6-CNP-00005

- Added some instrumentation and equipment specifications (capacities and model numbers)
- Vessel CRP-VSL-00002 has been removed to improve the flow of the resin
- Vessels RDP-VSL-00002A through -00002C are shown in duplicate
- Added plant wash lines upstream of the rack
- Changed drain header wash line PWD-ZS-06449-S11C-02 to PWD-ZS-06450-S11C-02
- Added and/or revised quality levels and seismic categories
- Revised nozzle numbers
- Revised slope indicators
- Editorial revisions to notes 4 and 10
- Added notes 15 through 17
- Deleted notes 5, 6, 8, 9, 11 through 14
- Added a reference

Quarter Ending 12/31/2009 24590-PTF-PCN-ENV-09-009

24590-PTF-M6-CNP-00010

- Added some equipment specifications (capacities, dimensions and model numbers)
- Revised instrumentation, including moving pressure relief devices (PSV 0232 and 0238) from cooling water supply line CNP-WS-01570-S11C-08 to CNP-WS-01533-S11C-08
- Rerouted CNP-GZ-00004-S11X-01 leading to CNP-HX-00003
- Added return line CNP-PW-00025-S11X-02/04 on CNP-HX-00002
- Added line leading from CNP-PUMP-00002 to CNP-EVAP-00001
- Modified Bechtel/Vendor boundary lines
- Added and/or revised quality levels and seismic categories
- Revised nozzle numbers
- Editorial revisions to notes 4, 8, and 14
- Added notes 16 through 21
- Deleted notes 5 through 7, 10 through 13, and 15

The following is a list of outstanding change documents that have not been incorporated into this modification:

24590-PTF-M6-CNP-00003

- 24590-PTF-M6N-10-00005
- 24590-PTF-M6N-M80T-00055
- 24590-PTF-M6N-M80T-00057
- 24590-PTF-M6PR-10-00002

24590-PTF-M6-CNP-00005

- 24590-PTF-M6N-M80T-00068

24590-PTF-M6-CNP-00010

- 24590-PTF-M6N-CNP-00084
- 24590-PTF-M6PR-CNP-00001

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number:

Enter wording of WAC 173-303-830, Appendix I Modification citation:

In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class [1]1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Modification Approved/Concur: [X] Yes [ ] Denied (state reason below)

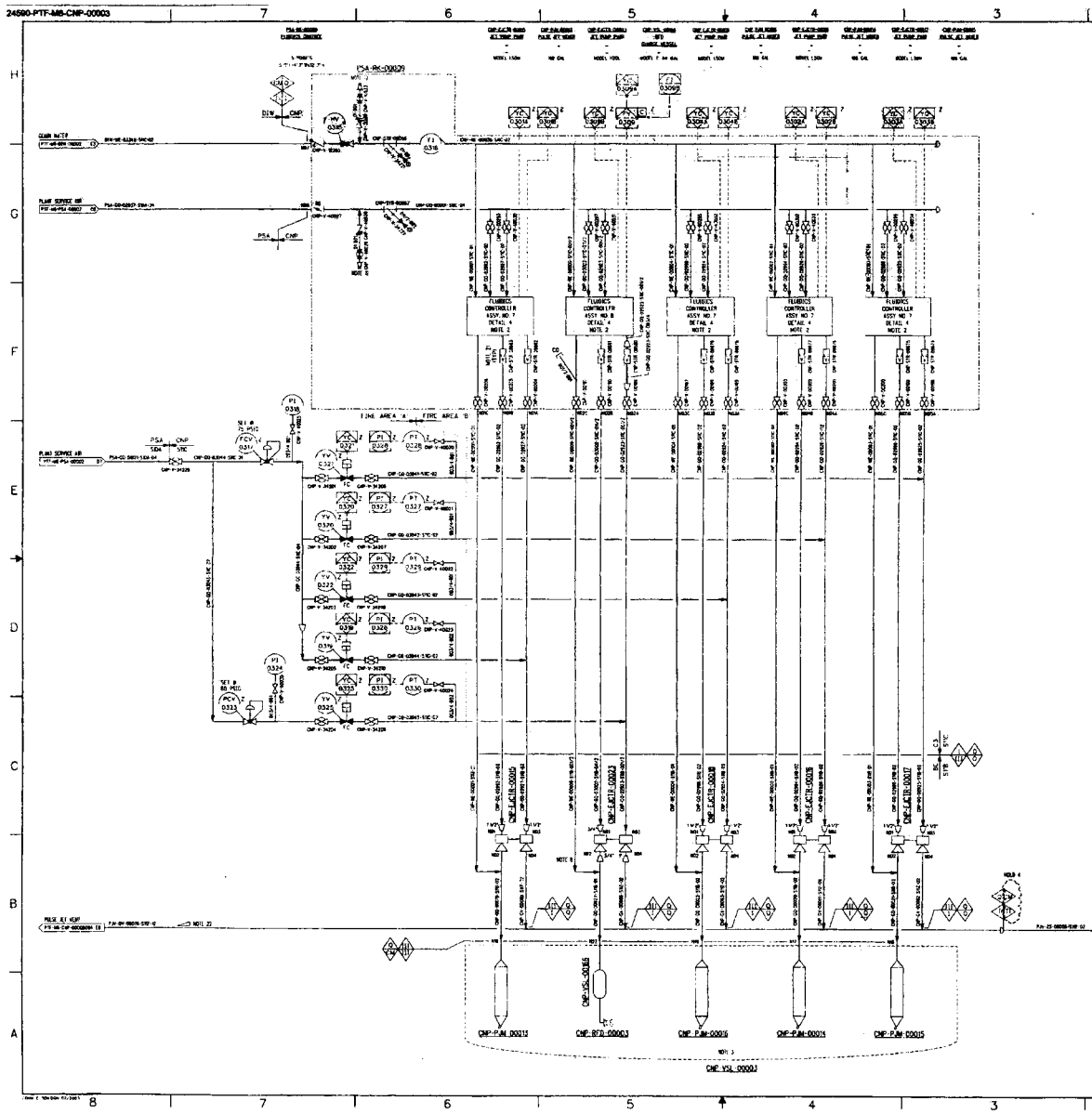
Reason for denial:

Reviewed by Ecology:

Kelly Elsethagen for 11-6-09

Kelly Elsethagen Date

24590-PTF-M6-CNP-00003



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00004 FOR GENERAL NOTES, SYMBOLS, AND LEGEND, AND GENERAL SCOPE REQUIREMENTS.
2. SEE WTP PUMP PAIR CONTROL DETAIL ON LEGEND SHEET 24590-WTP-M6-S0-00001.
3. FOR PROCESS INFORMATION REFER TO PIPING & INSTRUMENTATION DIAGRAM 24590-PTF-M6-CNP-00001.
4. L -DELETED
5. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE-RELATED AFFECTING.
7. DELETED
8. A 45-DEGREE WYE PIPE FITTING SHALL BE USED AT THIS CONNECTION AND LOCATION.
9. L1 DELETED
12. CONNECTION PROVIDED FOR REAGENTS, PLANT WASH, AND SERVICE AIR.
13. 15 - DELETED
17. REVISION 3B INCORPORATED 24590-PTF-MEN-CNP-00030, 24590-PTF-MEN-CNP-00037, 24590-PTF-MEN-M001-00007, 24590-PTF-MEN-M007-00011, 24590-PTF-MEN-M001-00017, ADDED NOZZLE NUMBERS, NOTE 8, CHANGED LINE REMARK, REVISED NOTES 3 & 34, DELETED CHECK VALVE, REVISED QUALITY/SEISMIC CLASSIFICATION, CORRECTED MATERIAL CLASS BREAK, ADDED NOTES 15 & 16.
18. DELETED
19. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL 1 AND SEISMIC CATEGORY SC-1, UNLESS OTHERWISE NOTED.
20. FLAW/RFD CONTROLLERS TO BE PROGRAMMED FOR PERIODIC OPERATION OF SUCTION MODE.
21. STRAINER IS A CONICAL PILGRIM HAT TYPE STRAINER WITH PERFORATE 1/8 INCH DIAMETER STAGGERED HOLES ON 3/16 INCH CENTERS PERMANENTLY INSTALLED UPSTREAM OF THE FLANGED VALVE.
22. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF DRAINING UNLESS OTHERWISE NOTED.
23. REVISION 4 MAJOR REVISION, NO REVISION CLOUDS REQUIRED. INCORPORATED 24590-PTF-MEN-CNP-00040, 24590-PTF-MEN-M007-00038, -00039, AND -00038, AND FURTHER REVISED REVISED QUALITY/SEISMIC CATEGORY FLAGS, ADDED/DELETED/REVISED NOTES AND HOLDS.

HOLD/OPEN ITEMS:

1-3 DELETED

4. QUALITY LEVEL, DESIGNATION AND SEISMIC CATEGORY CLASSIFICATION ON HOLD PENDING APPROVAL OF AUTHORIZATION BASIS AMENDMENT REQUEST: 24590-WTP-SEQ-QB-0120 (FUTURE)

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE CNP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CNP SYSTEM DESCRIPTION (FUTURE REVISION).

REV.	DESCRIPTION	DRC	CHKD	REVIEWED	APPR	DATE
3	REVISED PER NOTE 23					
2	REVISED PER NOTE 17					
1	ISSUED FOR CONSTRUCTION					

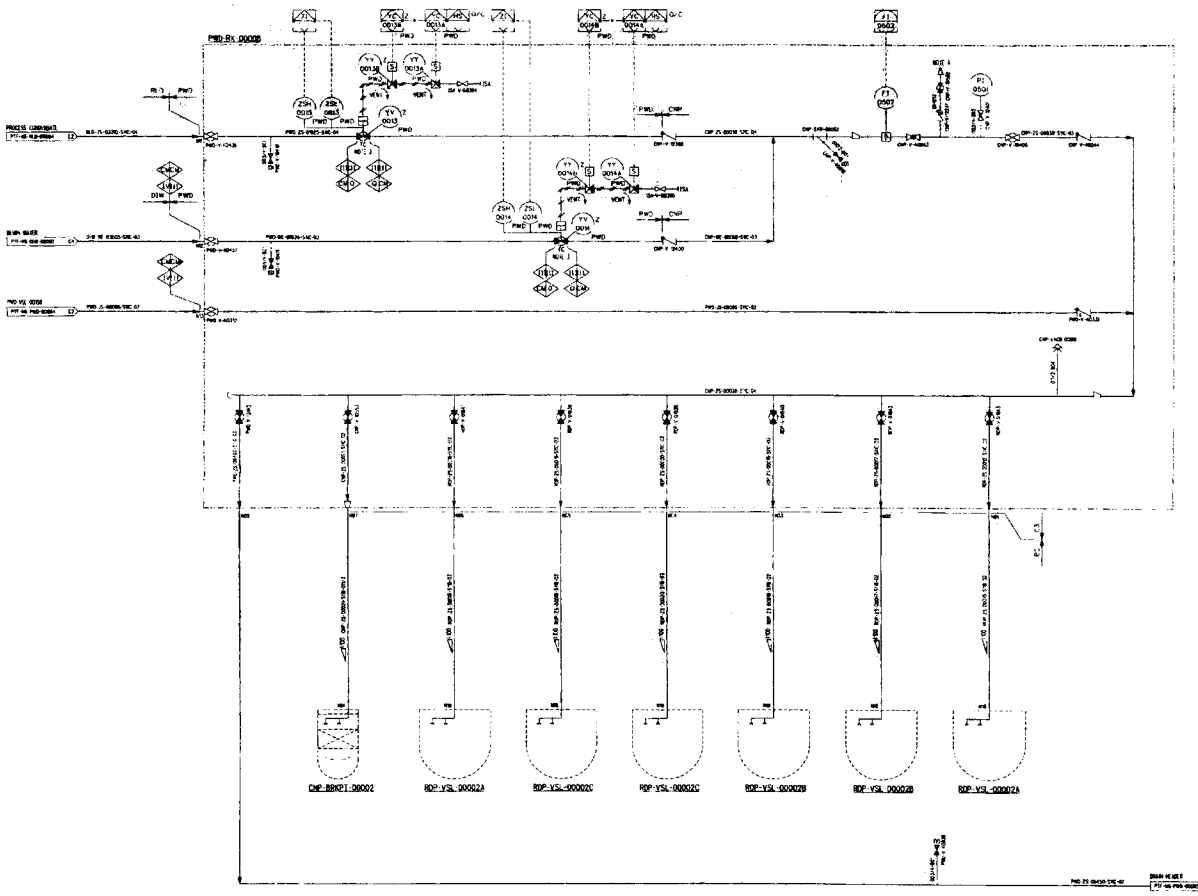
REVISION HISTORY

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

P&ID - PTF
CESIUM NITRIC ACID RECOVERY
UTILITY SERVICES - PSA RACK

24590-PTF-M6-CNP-00003

24590-PTF-M6-CNP-00005



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. DELETED
3. VALVES INTERLOCKED TO PREVENT MULTIPLE VALVE OPERATION.
4. CONNECTION PROVIDED FOR REAGENTS, PLANT WASH, PLANT SERVICE AIR AT A LOCAL UTILITY STATION.

5-6. DELETED

7. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.

8-9. DELETED

10. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL CM AND SEISMIC CATEGORY SC-III, UNLESS OTHERWISE NOTED.

11-14. DELETED

15. REVISION 5 INCORPORATED 24590-PTF-MSH-CNP-00023, AND 24590-PTF-MSH-MB01-00006.

16. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING, EXCEPT BLACK CELL LINES WHICH ARE SELF-DRAINING, UNLESS OTHERWISE NOTED.

17. REVISION 2 MAJOR REVISION AND REVISION CLOUDS REQUIRED REVISED TO INCORPORATE 24590-PTF-MSH-CNP-00038, -00041, -00057, -00075, 24590-PTF-MSH-MB01-00028, -00037, AND -00038, AND FURTHER REVISED ADDED LINE SECTIONS, VORTEX METER, REDUCERS, AND VACUUM BREAKER. CHANGED QUALITY LEVEL, SEISMIC CATEGORY, AND SLOPES. DELETED SPARES AND NOZZLE NUMBERS. ADDED/DELETED/REVISED NOTES.

HOLD/OPEN ITEMS:

1-2. DELETED

REFERENCES:

1. THE REQUIRED INTERLOCK SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS, AND DIS/MATCH INTERFACE POINTS ARE FULLY DESCRIBED IN THE CNP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CNP SYSTEM DESCRIPTION (FUTURE REVISION).

REV	DESCRIPTION	DRG	CHKD	REVIEWED	APVD	DATE
7	REVISED PER NCE 17					
6	REVISED PER NCE 15	MLC	SC	ABS	LJ	10/11/04
5	ISSUED FOR CONSTRUCTION	RV	RA	JF	SC	9/1/03

REVISION HISTORY

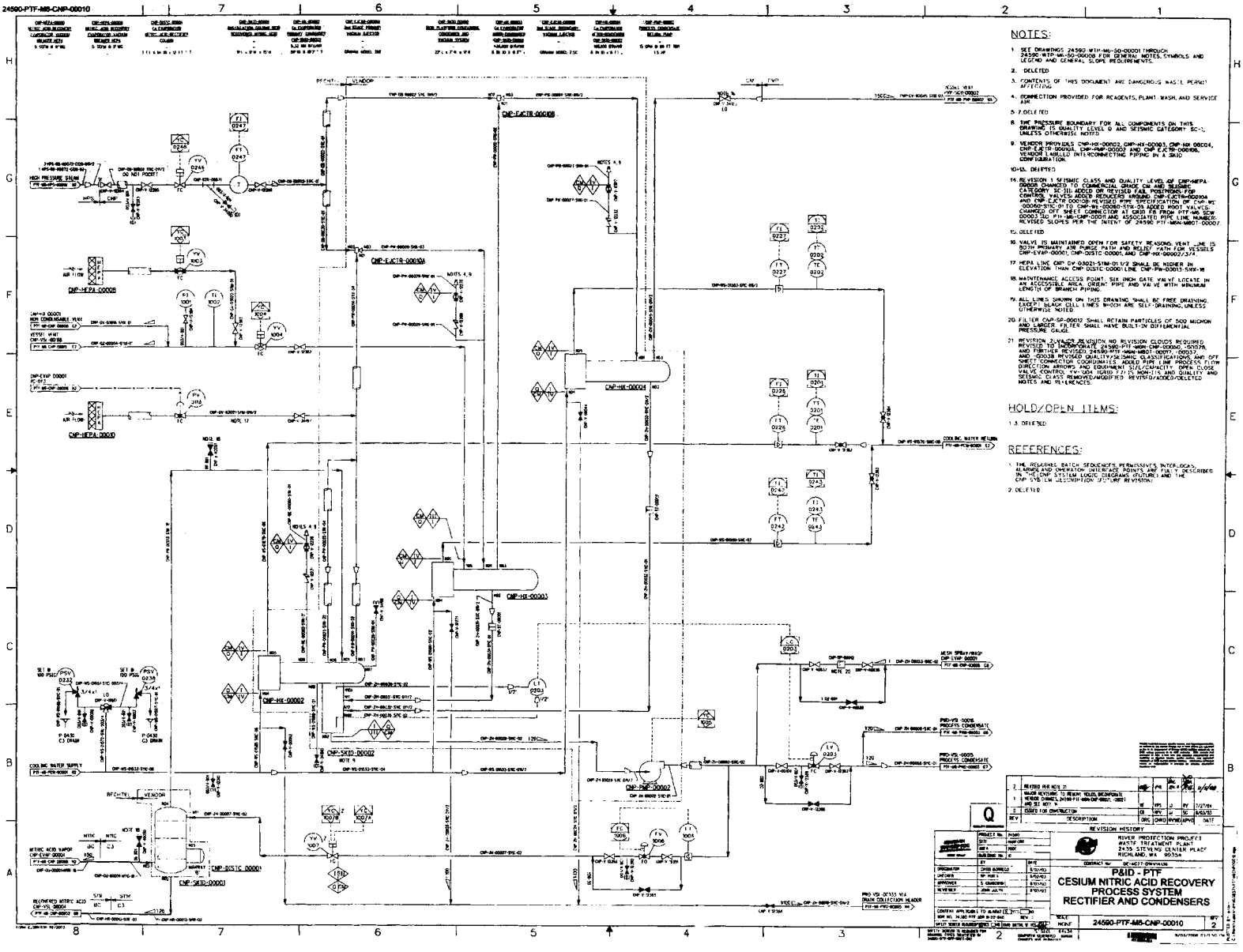
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-01RV14136

P&ID - PTF
CESIUM NITRIC ACID RECOVERY UTILITY SERVICES PLANT WASH RACK

SHEET: 24590-PTF-M6-CNP-00005 REV: 2

24590-PTF-M6-CNP-00010



NOTES:

1. SEE DRAWINGS 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND AND GENERAL SLOPE REQUIREMENTS.
2. DELETED
3. CONTENTS OF THIS DOCUMENT ARE DANGEROUS WASTE PERMIT AFFECTING.
4. CONNECTION PROVIDED FOR REAGENTS, PLANT WASH, AND SERVICE AIR.
5. 7. DELETED
6. THE PRESSURE BOUNDARY FOR ALL COMPONENTS ON THIS DRAWING IS QUALITY LEVEL D AND SEISMIC CATEGORY SC-I, UNLESS OTHERWISE NOTED.
9. VENDOR PROVIDES CNP-HX-00003, CNP-HX-00003, CNP-HX-00004, CNP-EJCTR-00008, CNP-PMP-00002 AND CNP-EJCTR-00010A, VENDOR SHOULD INTERCONNECTING PIPING IN A SKID CONFIGURATION.

10-13. DELETED

14. REVISION 1 SEISMIC CLASS AND QUALITY LEVEL OF CNP-HEPA-00008 CHANGED TO COMMERCIAL GRADE CM AND SEISMIC CATEGORY SC-III. ADDED OR REVISED FAIL POSITIONS FOR CONTROL VALVES. ADDED REDUCERS AROUND CNP-EJCTR-00004 AND CNP-EJCTR-00010B. REVISED PIPE SPECIFICATION OF CNP-WC-00040-STIC-01 TO CNP-WS-00060-STIC-01. ADDED ROOT VALVES. CHANGED OFF SHEET CONNECTOR AT GRID F8 FROM PTF-M6 SCH 00003 TO PTF-M6-CNP-00011 AND ASSOCIATED PIPE LINE NUMBER. REVISED SLOPES PER THE INTENT OF 24590-PTF-M6N-M6DT-00007.

15. DELETED

16. VALVE IS MAINTAINED OPEN FOR SAFETY REASONS. VENT LINE IS BOTH PRIMARY AIR PURGE PATH AND RELIEF PATH FOR VESSELS CNP-EVAP-00001, CNP-DISTC-00001, AND CNP-HX-00002/3/4.

17. HEPA LINE CNP CV 00021-S1M-01 1/2 SHALL BE HIDDEN IN ELEVATION THAN CNP-DISTC-00001 LINE CNP-PW-00013-SW-M

18. MAINTENANCE ACCESS POINT. SIX INCH GATE VALVE LOCATE IN AN ACCESSIBLE AREA. DRAIN PIPE AND VALVE WITH MINIMUM LENGTH OF BRANCH PIPING.

19. ALL LINES SHOWN ON THIS DRAWING SHALL BE FREE DRAINING. EXCEPT: BLACK CELL LINES WHICH ARE SELF-DRAINING, UNLESS OTHERWISE NOTED.

20. FILTER CNP-SP-00002 SHALL RETAIN PARTICLES OF 500 MICRON AND LARGER. FILTER SHALL HAVE BUILT-IN DIFFERENTIAL PRESSURE GAUGE.

21. REVISION 2: MAJOR REVISION NO REVISION CLOUDS REQUIRED. REVISED TO INCORPORATE 24590-PTF-M6N-CNP-00040, -00078, AND FURTHER REVISED 24590-PTF-M6N-M6DT-00077, -00037, AND -00038. REVISED QUALITY/SEISMIC CLASSIFICATIONS AND OFF SHEET CONNECTOR COORDINATES. ADDED PIPE LINE PROCESS FLOW DIRECTION ARROWS AND EQUIPMENT SIZE/CAPACITY. OPEN CLOSE VALVE CONTROL FV-1004 (GRID F2) IS NON-ITS AND QUALITY AND SEISMIC CLASS REMOVED/MODIFIED. REVISED/ADDED/DELETED NOTES AND REFERENCES.

HOLD/OPEN ITEMS:

1-3. DELETED

REFERENCES:

1. THE REQUIRED BATCH SEQUENCE, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATION INTERFACE POINTS ARE FULLY DESCRIBED IN THE CNP SYSTEM LOGIC DIAGRAMS (FUTURE) AND THE CNP SYSTEM DESCRIPTION (FUTURE REVISION).
2. DELETED

REV	DESCRIPTION	DRG	CHKD	REVIEW	APVD	DATE
2	REVISED PER NOTE 21					
1	MAJOR REVISION TO REMOVE VESSEL INCORPORATE VENDOR CHANGES, 24590-PTF-M6N-CNP-00021, -00027 AND SEE NOTE 14					
0	ISSUED FOR CONSTRUCTION	CB	RPV	JJ	SC	9/23/03

REVISION HISTORY

Q

PROJECT No.	24590	
SITE	HANFORD	
AREA	NWCF	
BUILDING No.	C	
DRAWN	CHRIS BORRELLO	9/23/03
CHECKED	RP. YUN	9/23/03
APPROVED	S. CHANDRAN	9/23/03
REVIEWED	JOHN JULYK	9/23/03

CONTENT APPROVED TO ISSUED (X) YES ( ) NO

WTP DATA MANAGEMENT

CONTRACT No: DE-AC27-01RV14136

P&ID - PTF

CESIUM NITRIC ACID RECOVERY PROCESS SYSTEM RECTIFIER AND CONDENSERS

SCALE: NONE

24590-PTF-M6-CNP-00010

SHT 2

Quarter Ending 12/31/2009 24590-PTF-PCN-ENV-09-010

Hanford Facility RCRA Permit Modification Notification Form
Part III, Operating Unit 10
Waste Treatment and Immobilization Plant

Index

Page 2 of 3: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant
Update Piping & Instrumentation Diagrams (P&IDs) for the Waste Feed Receipt Vessels, Waste Feed Receipt Utility Services - PSA Rack, in Appendix 8.2 of the Dangerous Waste Permit.

Submitted by Co-Operator:

BTAlles for DBusche 9/24/09

D. M. Busche Date

Reviewed by ORP Program Office:

10/14/09

G. A. Girard Date

Quarter Ending 12/31/2009 24590-PTF-PCN-ENV-09-010

Hanford Facility RCRA Permit Modification Notification Form	
Unit: **Waste Treatment and Immobilization Plant**	Permit Part: **Part III, Operating Unit 10**

Description of Modification:

The purpose of this Class 1 prime modification is to update the Piping and Instrumentation Diagrams (P&IDs) for the Waste Feed Receipt Vessels, Waste Feed Receipt Utility Services - PSA Rack. The following P&IDs are submitted to supply additional details for those currently in Appendix 8.2.

Appendix 8.2			
Additional Detail for:	24590-PTF-M6-FRP-00005, Rev 3	Continued on:	24590-PTF-M6-FRP-00017, Rev 0
	24590-PTF-M6-FRP-00006, Rev 3		24590-PTF-M6-FRP-00018, Rev 0
	24590-PTF-M6-FRP-00007, Rev 3		24590-PTF-M6-FRP-00019, Rev 0
	24590-PTF-M6-FRP-00008, Rev 3		24590-PTF-M6-FRP-00020, Rev 0

Note:
24590-PTF-PCN-ENV-08-001 originally replaced the permit version drawings as follows:

Appendix 8.2			
Replace:	24590-PTF-M6-FRP-P0005, Rev 0	With:	24590-PTF-M6-FRP-00005, Rev 3
	24590-PTF-M6-FRP-P0006, Rev 0		24590-PTF-M6-FRP-00006, Rev 3
	24590-PTF-M6-FRP-P0007, Rev 0		24590-PTF-M6-FRP-00007, Rev 3
	24590-PTF-M6-FRP-P0008, Rev 0		24590-PTF-M6-FRP-00008, Rev 3

This update supplies additional details of the pulse jet mixers and attendant utilities that were not provided with that update. No other significant changes were made.

The following is a list of outstanding change documents that have not been incorporated into this modification.

24590-PTF-M6-FRP-00017, Rev 0
- 24590-PTF-M6LN-FRP-00002
- 24590-PTF-M6LN-FRP-00006
- 24590-PTF-M6N-FRP-00060
- 24590-PTF-M6N-FRP-00066

24590-PTF-M6-FRP-00018, Rev 0
- 24590-PTF-M6LN-FRP-00002
- 24590-PTF-M6LN-FRP-00004
- 24590-PTF-M6N-FRP-00054
- 24590-PTF-M6N-FRP-00066

24590-PTF-M6-FRP-00019, Rev 0
- 24590-PTF-M6LN-FRP-00002
- 24590-PTF-M6N-FRP-00055
- 24590-PTF-M6N-FRP-00066

24590-PTF-M6-FRP-00020, Rev 0
- 24590-PTF-M6LN-FRP-00002
- 24590-PTF-M6N-FRP-00056
- 24590-PTF-M6N-FRP-00066

Quarter Ending 12/31/2009

24590-PTF-PCN-ENV-09-010

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number:

Enter wording of WAC 173-303-830, Appendix I Modification citation:

In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class [1]1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Modification Approved/Concur: [X] Yes [ ] Denied (state reason below)

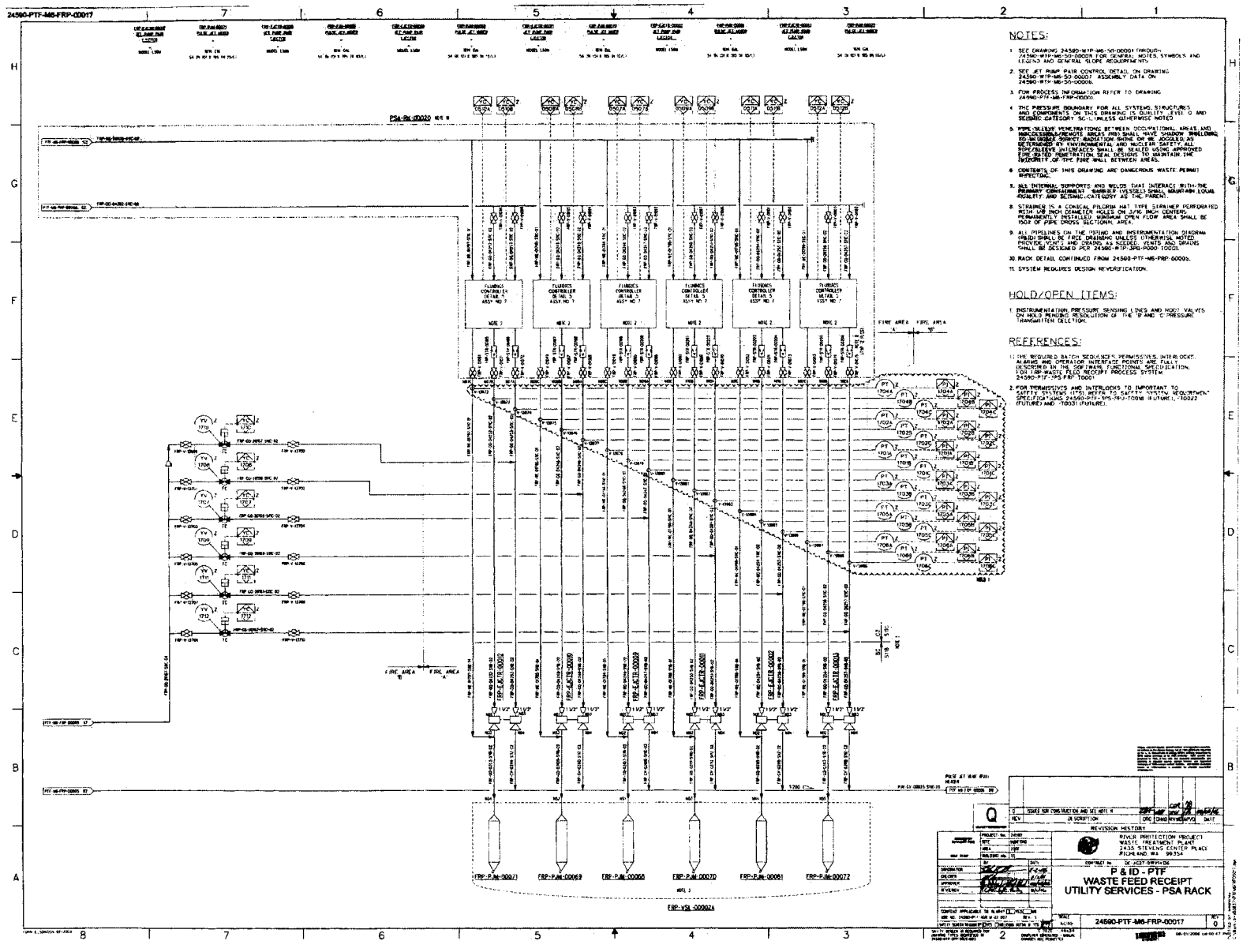
Reason for denial:

Reviewed by Ecology:

K. Elsethagen 11-20-2009

Kelly Elsethagen — Date

24590-PTF-M6-FRP-00017



NOTES:

1. SEE DRAWING 24590-WTP-M6-N0-00001 THROUGH 24590-WTP-M6-N0-00009 FOR GENERAL NOTES, SYMBOLS AND LEGEND AND GENERAL SLURRY REQUIREMENTS.
2. SEE JET PUMP PAIR CONTROL DETAIL ON DRAWING 24590-WTP-M6-N0-00007. ASSEMBLY DATA ON 24590-WTP-M6-N0-00008.
3. FOR PROCESS INFORMATION REFER TO DRAWING 24590-PTF-M6-FRP-00001.
4. THE PRESSURE BOUNDARY FOR ALL SYSTEMS, STRUCTURES AND COMPONENTS ON THIS DRAWING IS QUALITY LEVEL Q AND SEISMIC CATEGORY SC-I UNLESS OTHERWISE NOTED.
5. PIPE SLEEVES PENETRATING BETWEEN OCCUPATIONAL AREAS AND NON-OCCUPIABLE REMOTE AREAS PRO SHALL HAVE SHADOW SHIELDING SO AN UNDUE DIRECT RADIATION SHINE ON THE OCCUPIED AS DETERMINED BY ENVIRONMENTAL AND NUCLEAR SAFETY. FIRE/SLEEVE PENETRATIONS SHALL BE SEALED USING APPROVED FIRE-RATED CONFIGURATION SEAL DESIGNED TO MAINTAIN THE INTEGRITY OF THE FIRE WALL BETWEEN AREAS.
6. CONTENTS OF THIS DRAWING ARE DANGEROUS WASTE PERMIT EFFECTIVE.
7. ALL INTERNAL SUPPORTS AND WELDS THAT INTERFACE WITH THE PRIMARY CONFINEMENT BARRIER (VESSELS) SHALL MAINTAIN EQUAL QUALITY AND SEISMIC CATEGORY AS THE PARENT.
8. STRAINER IS A CONICAL PILGRIM HAT TYPE STRAINER PERFORATED WITH 1/8 INCH DIAMETER HOLES ON 3/16 INCH CENTERS. PERMANENTLY INSTALLED MINIMUM OPEN FLOW AREA SHALL BE 150% OF PIPE CROSS SECTIONAL AREA.
9. ALL PIPELINES ON THE PIPING AND INSTRUMENTATION DIAGRAM (P&ID) SHALL BE FROM DRAWING UNLESS OTHERWISE NOTED. PROVIDED BY THE DRAWING UNLESS OTHERWISE NOTED AND DRAWING SHALL BE DESIGNED PER 24590-WTP-SPG-P000-10001.
10. RACK DETAIL CONTINUED FROM 24590-PTF-M6-FRP-00009.
11. SYSTEM REQUIRES DESIGN REVERIFICATION.

HOLD/OPEN ITEMS:

1. INSTRUMENTATION, PRESSURE SENSING LINES AND NOZZLE VALVES ON HOLD PENDING RESOLUTION OF THE 'B' AND 'C' PRESSURE TRANSMITTER DELETION.

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE SOFTWARE FUNCTIONAL SPECIFICATION, TOD 1 FRP-WASTE FEED RECEIPT PROCESS SYSTEM, 24590-PTF-TMS-FRP-T0001.
2. FOR PERMISSIVES AND INTERLOCKS TO IMPORTANT TO SAFETY SYSTEMS (ITS), REFER TO SAFETY SYSTEM REQUIREMENT SPECIFICATIONS 24590-PTF-SYS-PRJ-T0016 (FUTURE), -T0022 (FUTURE) AND -T0031 (FUTURE).

Q

REV	DESCRIPTION	DRC	CHKD	RVWD	APVD	DATE
0	ISSUED FOR CONSTRUCTION AND SEE NOTE 11					

REVISION HISTORY

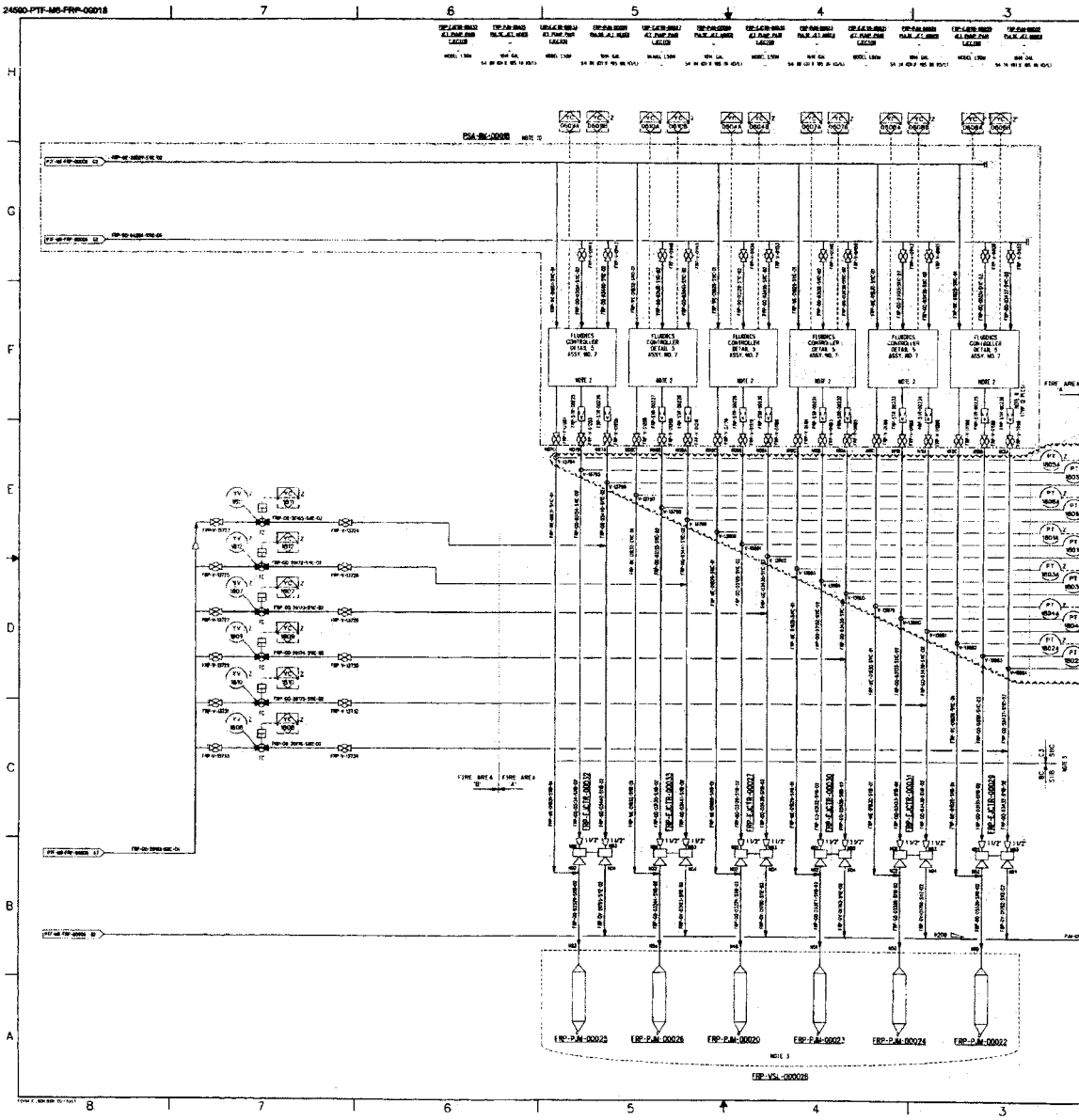
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No. DE-AC27-99RL14047

P & ID - PTF
WASTE FEED RECEIPT UTILITY SERVICES - PSA RACK

24590-PTF-M6-FRP-00017 REV 0

24590-PTF-M6-FRP-00018



NOTES:

1. SEE DRAWING 24590-WTP-M6-S0-00001 THROUGH 24590-WTP-M6-S0-00006 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. SEE JET PUMP PAIR CONTROL DETAIL ON DRAWING 24590-WTP-M6-S0-00007. ASSEMBLY DATA ON 24590-WTP-M6-S0-00006.
3. FOR PROCESS INFORMATION REFER TO DRAWING 24590-PTF-M6-FRP-00001.
4. THE PRESSURE BOUNDARY FOR ALL SYSTEMS, STRUCTURES AND COMPONENTS ON THIS DRAWING IS QUALITY LEVEL 1 AND SEISMIC CATEGORY SC-I, UNLESS OTHERWISE NOTED.
5. PIPE SLEEVE PENETRATIONS BETWEEN OCCUPATIONAL AREAS AND MODERATE RADIOGENIC AREAS (RA) SHALL HAVE SHADOW SHIELDING TO MITIGATE DIRECT RADIATION SHINE OR BE JOGGLED AS DETERMINED BY ENVIRONMENTAL AND NUCLEAR SAFETY. ALL PIPE SLEEVE INTERFACES SHALL BE SEALED USING APPROVED FIRE STOPS. PENETRATION SEAL DESIGNS TO MAINTAIN THE INTEGRITY OF THE FIRE WALL BETWEEN AREAS.
6. CONTENTS OF THIS DRAWING ARE DANGEROUS WASTE PERMIT EFFECTIVE.
7. ALL INTERNAL SUPPORTS AND WELDS THAT INTERACT WITH THE PRIMARY CONTAINMENT BARRIER (VESSEL) SHALL MAINTAIN EQUAL QUALITY AND SEISMIC CATEGORY AS THE PARENT.
8. STRAINER IS A CONICAL PERFORM HAT TYPE STRAINER PERFORATED WITH 1/8 INCH DIAMETER HOLES ON 1/4 INCH CENTERS PERMANENTLY INSTALLED. MINIMUM OPEN FLOW AREA SHALL BE 150% OF PIPE CROSS SECTIONAL AREA.
9. ALL PIPELINES ON THE PIPING AND INSTRUMENTATION DIAGRAM (P&ID) SHALL BE FREE DRAINING UNLESS OTHERWISE NOTED. PROVIDE VENTS AND DRAINS AS NEEDED. VENTS AND DRAINS SHALL BE DESIGNED PER 24590-WTP-SPS-P000-T0001.
10. RACK DETAIL CONTINUED FROM 24590-PTF-M6-FRP-00008.
11. SYSTEM REQUIRES DESIGN REVERIFICATION.

HOLD/OPEN ITEMS:

1. INSTRUMENTATION, PRESSURE SENSING LINES AND ROOT VALVES ON HOLD PENDING RESOLUTION OF THE "B" AND "C" PRESSURE TRANSMITTER DEFICITION.

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN ITS 5.01 (MAXF - FUNCTIONAL SPECIFICATION, FRP-TREATED WASTE FEED RECEIPT PROCESS SYSTEM, 24590-WTP-SPS-FRP-T0001.
2. FOR PERMISSIVES AND INTERLOCKS TO IMPORTANT TO SAFETY SYSTEMS (ITS) REFER TO SAFETY SYSTEM REQUIREMENT SPECIFICATIONS (24590-WTP-SPS-PPP-T0018 (FUTURE), T0012 (FUTURE) AND T0031 (FUTURE).

REV	DESCRIPTION	DRC	CHKD	REVWD	APVD	DATE
Q	ISSUED FOR CONSTRUCTION AND SEE NOTE 11					

REVISION HISTORY

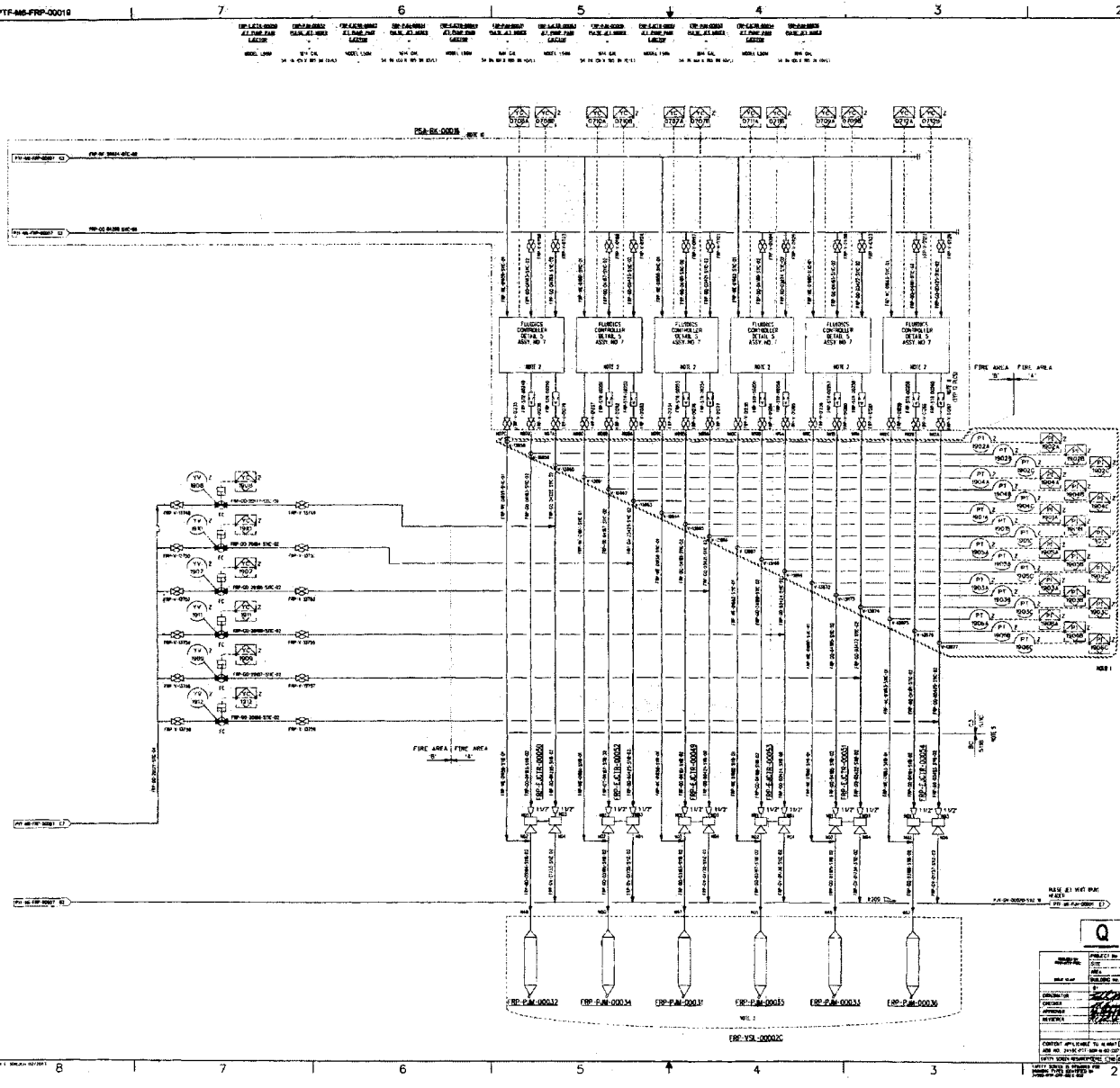
RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT NO. DE-AC27-01RV14136

P&ID - PTF
WASTE FEED RECEIPT UTILITY SERVICES - PSA RACK

SCALE: NONE | 24590-PTF-M6-FRP-00018 | REV 0

24590-PTF-M6-FRP-00019



NOTES:

1. SEE DRAWING 24590-WTP-M6-50-00001 THROUGH 24590-WTP-M6-50-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. SEE J-1 PUMP PAIR CONTROL DETAIL ON DRAWING 24590-WTP-M6-50-00007 ASME-MAX DATA ON 24590-WTP-M6-50-00006
3. FOR PROCESS INFORMATION REFER TO DRAWING 24590-PTF-M6-FRP-00003.
4. THE PRESSURE BOUNDARY FOR ALL SYSTEMS, STRUCTURES, AND COMPONENTS ON THIS DRAWING IS QUALITY LEVEL D AND SEISMIC CATEGORY SC-I, UNLESS OTHERWISE NOTED.
5. PIPE SLEEVE PENETRATIONS BETWEEN OCCUPATIONAL AREAS AND MAINTENANCE/REMOTE AREAS (RM) SHALL HAVE SHADOW SHIELDING TO MITIGATE DIRECT RADIATION SHINE OR BE JUDGED, AS DETERMINED BY ENVIRONMENTAL AND NUCLEAR SAFETY, ALL PIPE/SLEEVE INTERFACES SHALL BE SEALED USING APPROVED FIRE/WATER PENETRATION SEAL DESIGNS TO MAINTAIN THE INTEGRITY OF THE FIRE WALL/BARRIER AREA.
6. CONTENTS OF THIS DRAWING ARE DANGEROUS WASTE PERMIT AFFECTED.
7. ALL INTERNAL SUPPORTS AND WELDS THAT INTERACT WITH THE PRIMARY CONTAINMENT BARRIER (VESSEL) SHALL MAINTAIN EQUIV QUALITY AND SEISMIC CATEGORY AS THE PARENT
8. STRAINER IS A CONICAL PERFORM HAT TYPE STRAINER PERFORATED WITH 1/8 INCH DIAMETER HOLES ON 3/16 INCH CENTERS. PERMANENTLY INSTALLED. MINIMUM OPEN FLOW AREA SHALL BE EQUAL OF PIPE CROSS SECTIONAL AREA.
9. ALL PIPELINES ON THE PIPING AND INSTRUMENTATION DIAGRAM (P&ID) SHALL BE FREE DRAWING UNLESS OTHERWISE NOTED. PROVIDE VENTS AND DRAINS AS NEEDED. VENTS AND DRAINS SHALL BE DESIGNED PER 24590-WTP-SPR-P00-10001.
10. RACK DETAIL CONTINUED FROM 24590-PTF-M6-FRP-00007
11. SYSTEM REQUIRES DESIGN REVERIFICATION.

HOLD/OPEN ITEMS:

1. INSTRUMENTATION, PRESSURE SENSING LINES, AND ROOT VALVES ON HOLD PENDING RESOLUTION OF THE 'B' AND 'C' PRESSURE TRANSMITTER SELECTION.

REFERENCES:

1. THE REQUIRED HATCH SEQUENCES, PERMISSIVES, INTERLOCKS, & ARRANGE OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN "FIT SOFTWARE FUNCTIONAL SPECIFICATION FOR FRP WASTE FEED RECEIPT PROCESS SYSTEM 24590-PTF-SFS-FRP-10001".
2. FOR VERIFICATIONS AND INTERLOCKS TO INPO0074A7 TO SAFETY TESTS REFER TO SAFETY SYSTEM REQUIREMENT SPECIFICATIONS 24590-WTP-SRS-PJ-10016 (FUTURE), -10022 (FUTURE) AND -10031 (FUTURE).

Q

REV	DESCRIPTION	DRC	CHKD	APPRD	DATE
0	ISSUED FOR CONSTRUCTION AND SEE NOTE 11				

REVISION HISTORY

RIVER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND, WA 99354

CONTRACT No DE-AC27-01RV14136

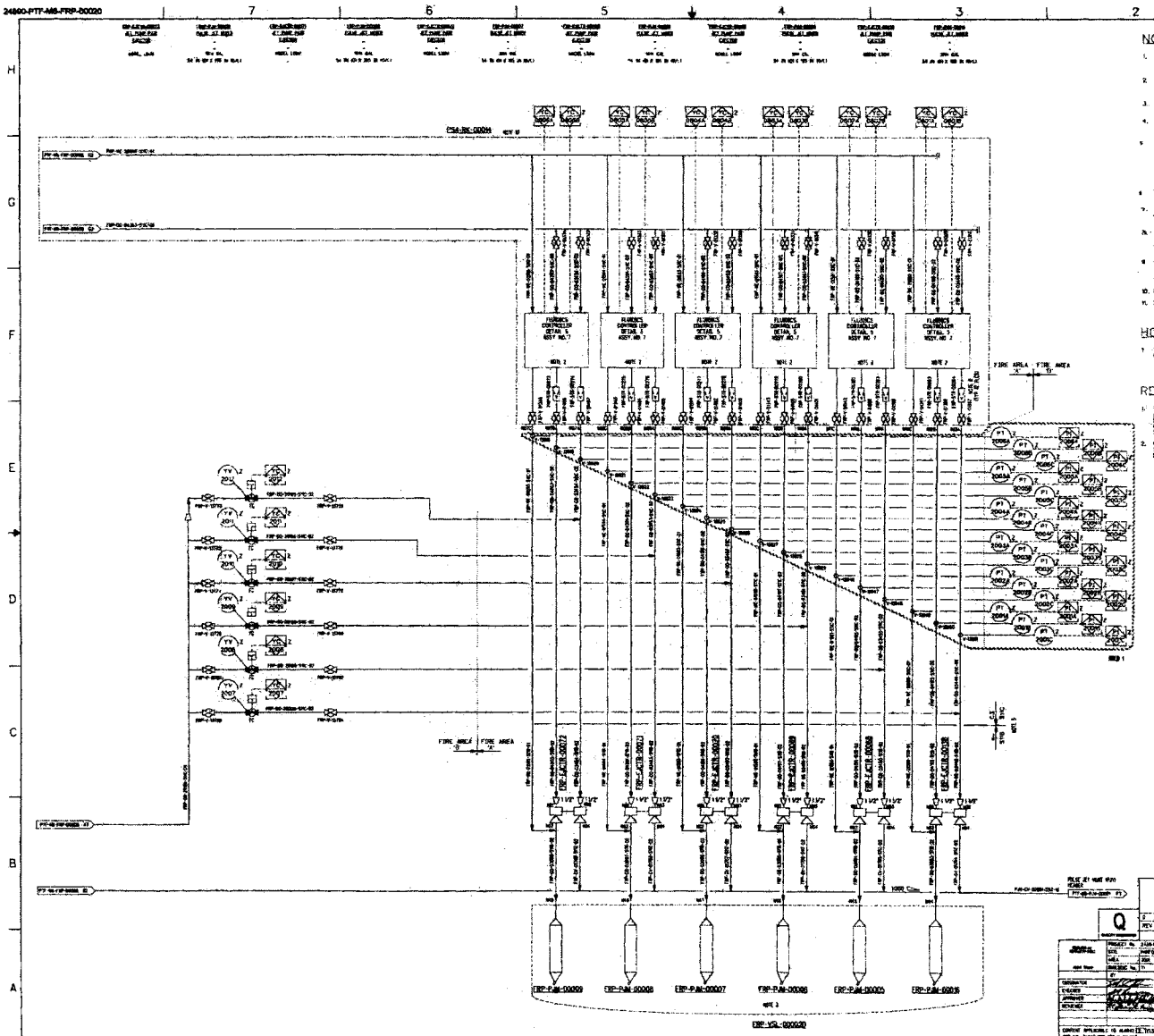
P&ID - PTF
WASTE FEED RECEIPT
UTILITY SERVICES - PSA RACK

SCALE: NONE

24590-PTF-M6-FRP-00019

REV 0

24590-PTF-M6-FRP-00020



NOTES:

1. SEE DRAWING 24590-WTP-MB-SG-00001 THROUGH 24590-WTP-MA-SG-00008 FOR GENERAL NOTES, SYMBOLS AND LEGEND, AND GENERAL SLOPE REQUIREMENTS.
2. SEE JET PUMP PAIR CONTROL DETAIL ON DRAWING 24590-WTP-MR-00 00007. ASSEMBLY DATA ON 24590-WTP-MB-SG-00006.
3. FOR PROCESS INFORMATION REFER TO DRAWING 24590-PTF-MB-FRP-00007.
4. THE PRESSURE BOUNDARY FOR ALL SYSTEMS, STRUCTURE, AND COMPONENTS ON THIS DRAWING IS QUALITY LEVEL 0 AND SEISMIC CATEGORY SC-I, UNLESS OTHERWISE NOTED.
5. PIPE SLEEVE PENETRATIONS BETWEEN OCCUPATIONAL AREAS AND UNATTENDED/REMOTE AREAS, UNDERSHALL PAVE SHADOW SHIELDING TO MITIGATE DIRECT RADIATION SHINE OR BE ENGINEERED AS BUILDING BY ENVIRONMENTAL SAFETY AND NUCLEAR SAFETY. ALL PIPE SLEEVE PENETRATIONS SHALL BE SEALED USING APPROVED FIRE-RESISTANT PENETRATION SEALS DESIGNED TO MAINTAIN THE SUPPROOF OF THE FIRE WALL RETAINED AREAS.
6. CONTENTS OF THIS DRAWING ARE DANGEROUS WASTE PERMIT AFFECTING.
7. ALL INTERNAL SUPPORTS AND WELDS THAT INTERFACE WITH THE PRIMARY CONTAINMENT BARRIER (VESSEL) SHALL MAINTAIN EQUAL QUALITY AND SEISMIC CATEGORY AS THE PARENT.
8. STRAINER USE A CONICAL PERFORATED HAT TYPE PERFORATED WITH 1/8 INCH DIAMETER HOLES ON 3/16 INCH CENTERS. PERMANENTLY INSTALLED MINIMUM OPEN FLOW AREA SHALL BE 150 X OF PIPE CROSS SECTIONAL AREA.
9. ALL PIPELINES ON THE PIPING AND INSTRUMENTATION DIAGRAM (P&ID) SHALL BE FREE DRAINING UNLESS OTHERWISE NOTED. PROVIDE VENTS AND DRAINS AS NEEDED. VENTS AND DRAINS SHALL BE DESIGNED PER P24590-WTP-SPR-M00-10004.
10. PACK DETAILS CONTINUED FROM 24590-WTP-MB-FRP-00006.
11. SYSTEM REQUIRES RESIGN REVALIDATION.

HOLD/OPEN ITEMS:

1. INSTRUMENTATION, PRESSURE SENSING LINES, AND ROOT VALVES ON HOLD PENDING RESOLUTION OF THE "B" AND "C" PRESSURE TRANSMITTER DELETION.

REFERENCES:

1. THE REQUIRED BATCH SEQUENCES, PERMISSIVES, INTERLOCKS, ALARMS AND OPERATOR INTERFACE POINTS ARE FULLY DESCRIBED IN THE SOFTWARE FUNCTIONAL SPECIFICATION, FOR FRP-WASTE FEED RECEIPT PROCESS SYSTEM, 24590-PTF-SPS-FRP-T0001.
2. FOR PERMISSIVES AND INTERLOCKS TO IMPORTANT TO SAFETY SPECIFICATION REFER TO SAFETY SYSTEM REQUIREMENT DOCUMENT, 24590-PTF-SRD-PS-00001 (FUTURE), 10027 (FUTURE) AND 10031 (FUTURE).

Q

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
2	REVIEW FOR DIAGNOSTICS AND SEE NOTE 8				

REVISION HISTORY

DRAWN		
CHECKED		
APPROVED		
REVIEWED		

REVISER PROTECTION PROJECT
WASTE TREATMENT PLANT
2435 STEVENS CENTER PLACE
RICHLAND WA 99354

CONTRACT NO. DE-AC27-01RV14136

P&ID - PTF
WASTE FEED RECEIPT
UTILITY SERVICES - PSA RACK

SCALE: NONE

24590-PTF-M6-FRP-00020

REV 0

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Quarter Ending September 30, 2009

24590-WTP-PCN-ENV-09-001

Hanford Facility RCRA Permit Modification Notification Form

Part III, Operating Unit 10

Waste Treatment and Immobilization Plant

Index

Page 2 of 2: Hanford Facility RCRA Permit, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant
Update "Installation of Tank Systems and Miscellaneous Unit Systems" in Appendix 7.12 of the Dangerous Waste Permit.

Submitted by Co-Operator:

D. M. Busche — Date: 7/30/09

Reviewed by ORP Program Office:

S. J. Dinger — Date: 8/31/09

Quarter Ending September 30, 2009

24590-WTP-PCN-ENV-09-001

Hanford Facility RCRA Permit Modification Notification Form

Unit:	Permit Part:
Waste Treatment and Immobilization Plant	**Part III, Operating Unit 10**

Description of Modification:

The purpose of this Class 1 modification is to update the WTP Installation of Tank Systems and Miscellaneous Unit Systems permit document. The following permitted document is submitted to replace the document currently in Appendix 7.12.

Appendix 7.12			
Replace:	24590-WTP-PER-CON-02-001, Rev 5	With:	24590-WTP-PER-CON-02-001, Rev 6

This modification requests Ecology approval and incorporation into the permit the specific changes to the document identified below.

- Incorporated independent inspection of tank internals for tanks received from vendors off the Waste Treatment Plant Site
- Re-numbered Section 2.5 to Section 3 and renamed section, "Certification of Installation."
- Editorial changes

WAC 173-303-830 Modification Class:	Class 1	Class [1]1	Class 2	Class 3
Please mark the Modification Class:		X		

Enter relevant WAC 173-303-830, Appendix I Modification citation number: N/A

Enter wording of WAC 173-303-830, Appendix I Modification citation:

In accordance with WAC 173-303-830(4)(d)(i), this modification notification is requested to be reviewed and approved as a Class [1]1 modification. WAC 173-303-830(4)(d)(ii)(A) states, "Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit conditions or reduce the capacity of the facility to protect human health or the environment. In the case of Class 1 modifications, the director may require prior approval."

Modification Approved/Concur: [X] Yes [ ] Denied (state reason below)

Reason for denial:

Reviewed by Ecology:

K. Elsethagen 10-1-2009

~~Ed Fredenburg~~ Date

Kelly Elsethagen

R10994953

Installation of Tank Systems and Miscellaneous Unit Systems

Document title: Installation of Tank Systems and Miscellaneous Unit Systems

Document number: 24590-WTP-PER-CON-02-001, Rev 6

Contract number: DE-AC27-01RV14136

Department: Construction

Author: Kenneth Keck

Signature: Kenneth Keck

Checked by: John Kramer

Signature: John F. Kramer

Issue status: Approved

Approved by: Andrew D. Morgan

Approver's position: Field Engineering Manager

Approver's signature: _____ Signature 5-14-09 Date

River Protection Project
Waste Treatment Plant
2435 Stevens Center Place
Richland, WA 99354
United States of America
Tel: 509 371 2000

Notice

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the US Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

History Sheet

Rev	Reason for revision	Revised by
0	Initial issue; Issued For Permitting Use	W Melvin
1	Incorporation of Washington State Department of Ecology Comments, CCN 048713	W Melvin
2	Incorporation of miscellaneous treatment equipment	W Melvin
3	Incorporate vacuum box testing; Replaced MRI with MAP for receipt inspection; Miscellaneous non-technical changes for clarity. Replaced WAC references with the appropriate permit condition references.	W Melvin
4	Incorporate Washington Department of Ecology Comments	W Melvin
5	Referenced DOE documents that affect ASME B31.3	W Melvin
6	Incorporated independent inspection of tank internals for tanks fabricated offsite per agreement with Ecology (CCN 186457/191987). Editorial changes to correct or clarify text. Extensive changes were necessary, therefore revision bars are not present.	K Keck

Contents

Notice ii
History Sheet iii
Acronyms and Abbreviations v
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2 Description of Installation 2
2.1 Receipt Inspection, Rigging, and Installation 2
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2.3 Control of Discrepancies 4
2.4 Testing 5
3 Certification of Installation 5
3.1 Independent Inspections 5
3.2 Corrosion Protection Inspection 6
3.3 Certification of Installation 6
4 Summary 6

Acronyms and Abbreviations

ASME	American Society of Mechanical Engineers
AWS	American Welding Society
CDR	Construction Deficiency Report
CM	Commercial Grade
DWP	Dangerous Waste Permit
IQRPE	Independent, Qualified, Registered, Professional Engineer
MAP	Material Acceptance Plan
MRI	Material Receipt Instruction
NCR	Nonconformance Report
NDE	Non-Destructive Examination
PADC	Project Archives and Document Control
Q	Quality
SSC	System, structure, component
WAC	Washington Administrative Code
WTP	Hanford Tank Waste Treatment and Immobilization Plant

1 Introduction

This document describes how the Hanford Tank Waste Treatment and Immobilization Plant (WTP) satisfies requirements of Washington Administrative Code (WAC) 173-303-640 and Dangerous Waste Permit (DWP) conditions associated with the proper installation and handling of the permitted tank and miscellaneous unit systems as described in the following DWP Conditions:

- III.10.E.3 for the installation of tank systems
- III.10.E.3.a. through c. and e. for the installation of tanks
- III.10.E.3.a. through e. for the installation and tightness testing of tank system ancillary equipment
- III.10.E.5.b. and III.10.E.9.d.x. for the installation and testing of tank system process, control and leak detection instrumentation
- III.10.G.3.a., III.10.H.1.a.iv. and III.10.J.1.a.iv. for the installation of secondary containment of miscellaneous unit systems
- III.10.G.3.a. through c. and e., III.10.H.1.a.iv. through vi. and viii., and III.10.J.1.a.iv. through vi. and viii. for the installation of miscellaneous units
- III.10.G.3.a. through e., III.10.H.1.a.iv. through viii. and III.10.J.1.a.iv. through viii. for the installation and tightness testing of miscellaneous unit system ancillary equipment
- III.10.G.5.b., III.10.G.10.d.x., III.10.H.1.a.xiv., III.10.H.5.d.x., III.10.I.1.a.viii., III.10.J.1.a.xiv., III.10.J.5.d.x., and III.10.K.1.a.viii. for the installation and testing of miscellaneous unit system process, control and leak detection instrumentation

Miscellaneous unit systems and tank systems are referred to as *DWP SSC in the remainder of this document..*

1.1 Applicable Documents

ASME Section VIII, *Pressure Vessels.*

ASME B 31.3 –, *Process Piping. (As tailored in 24590-WTP-SRD-ESH-01-001-02, Safety Requirement Document, Volume II, as amended, Appendix, C , Section C.26, which is not a permit affecting document.)*

ASME Section IX, *Qualification Standard for Welding and Brazing Procedures, Welders and Brazers and Welding and Brazing Operators.*

AWS D1.1, *Structural Welding Code – Steel.*

WAC, 173-303, *Dangerous Waste Regulations*

WAC, 173-303.640, *Tank Systems*

WA7890008967, *Dangerous Waste Portion of the Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste, Part III, Operating Unit 10, Waste Treatment and Immobilization Plant.*

2 Description of Installation

This section provides an overview of field activities associated with installation of DWP SSCs performed by Bechtel National, Incorporated (BNI) Construction and Field personnel, including quality control/assurance.

2.1 Receipt Inspection, Rigging, and Installation

The following is a list of activities that prevent defects in DWP SSCs during receiving, installation, and testing. Construction installation and inspection records are generated in accordance with project or vendors' procedures to document work processes. For the purpose of this document, they are referred to as the *Field Installation Report*. This term is consistent with the permit.

2.1.1 Receipt Inspection

A material acceptance plan (MAP) is generated based on key attributes that require independent verification. The MAP is developed from approved technical requirements taken from applicable codes, specifications, drawings, standards and other similar sources specific to the material requisition/ purchase order. Examples of requirements that may be found in a MAP include the following:

- specific attributes/activities that require independent verification:
  - material type/grade/class/color/finish
  - equipment type/rating/class/capacity/manufacturer
  - manufacturing methods/process/controls
  - size/shape dimensions
- hold/witness points
- specific acceptance criteria for defined attributes/activities directly or by reference
- proper identification of materials and DWP SSC items
- storage levels and any special requirements or conditions associated with receiving, handling and storage

2.1.2 Rigging

Rigging instructions are generated, when applicable, and ensure the following requirements are met:

- rigging equipment is of sufficient rating to perform the lift
- DWP SSCs are lifted in accordance with manufacturer's instructions when provided. When the vendor does not provide specific rigging instructions BNI standard rigging practices are employed.

Rigging equipment is examined periodically and required maintenance is performed to ensure proper function.

2.1.3 Installation

Installations of DWP SSCs and materials are documented on field installation/inspector reports. Activities that have field installation/inspector reports generated include the following:

- concrete placement, cure and finishing
- equipment installation/alignment
- installation of pipe/pipe supports
- welding activities
- bolt torquing
- coating system installation
- sub-grade and foundation materials and compaction
- rebar, embed, and anchor placement
- installation of liner plate
- installation of corrosion protection systems
- placement of shop and field fabricated tanks and miscellaneous units
- support installation
- instrument sensing lines and support installation
- instrument installation.

DWP SSCs and materials are inspected for physical damage at the time of installation.

Protective boxes, welding blankets, and access control are used, as necessary, to protect DWP SSCs and materials from damage during construction and testing.

2.2 Inspection

BNI inspections of DWP SSC installations are performed by persons qualified to perform the inspections. Inspections are performed prior to the DWP SSC being covered, enclosed, or placed in use. Inspections are documented on the field installation reports. The inspector's signature indicates compliance with the requirements.

Inspections are performed and documented to the current design at the time of inspection.

Current design is constituted by documents issued for construction; these include, but are not limited to the following:

- BNI approved vendor drawings
- BNI approved vendor installation manuals
- BNI approved vendor rigging instructions
- piping isometric drawings
- support drawings
- equipment location drawings
- concrete placement drawings
- embedded plate detail and location drawings
- instrument installation details
- approved interim design changes

Installation activities that are inspected include, but are not limited to, the following:

- sub-grade and foundation materials and compaction
- rebar, embed, and anchor placement
- concrete placement, cure, and finishing
- installation of liner plate
- installation of corrosion protection systems
- placement of shop and field fabricated tanks and miscellaneous units
- welding activities
- bolt torquing
- support installation
- instrumentation, instrument sensing lines and support installation
- instrument installation
- equipment installation/alignment
- coating system installation
- installation of pipe/pipe supports

Field installation reports are reviewed for accuracy and completeness. Retention of field installation reports is performed in accordance with Project Archives and Document Control (PADC) controls and procedures.

2.3 Control of Discrepancies

Discrepancies found during receipt, installation, surveillance, and test inspections are documented in a *nonconformance report* (NCR) for items identified as Quality (Q) and a *construction deficiency report* (CDR) for items identified as Commercial Grade (CM). An NCR/CDR provides the following:

- a detailed description of the discrepancy
- a description of the requirement
- a disposition to correct the discrepancy
- appropriate approvals of the disposition
- confirmation that the disposition has been completed

Hold tags are applied when appropriate to the discrepant item to prevent it from being covered, enclosed, or placed in use until the discrepancy has been remedied. Any discrepancies will be remedied prior to the DWP SSC being covered, enclosed, or placed in use. [Permit Conditions III.10.E.3.a. and c., III.10.G.3.a. and c., III.10.H.1.a.iv. and vi., and III.10.J.1.a.iv. and vi.].

NCRs/CDRs with a final disposition of "Use As Is" or "Repair" that affect critical systems are provided to the Washington Department of Ecology within five (5) calendar days in accordance with Permit Condition III.10.C.9.d.

Closed NCRs/CDRs are retained in PADC.

2.4 Testing

Tightness testing is performed in accordance with the design and installation code applicable to the DWP SSC. Testing is performed and inspected by persons competent in the performance of the applicable test (e.g. hydrostatic, pneumatic or vacuum box testing). Testing is documented to provide a record that the system or DWP SSC was tested for the prescribed period and fully inspected for leakage.

Process and control instrumentation for WTP DWP SSCs will be commissioned after installation. Commissioning will be performed using procedures that implement vendor technical guidance. Calibration procedures are written, reviewed, and approved to satisfy the program controls contained in WTP administrative procedures. If required, a loop calibration check will be performed to verify the proper instrument output to the WTP distributed control system. Similar to instrument calibrations, the instrument loop calibration check procedures will satisfy vendor guidance and WTP administrative controls.

3 Certification of Installation

Independent installation inspections are performed by BNI subcontractor as required by the WAC 173-303-640 and DWP Conditions. The independent inspector has full access to the job site including the opportunity to inspect DWP SSCs that are fabricated off site during installation on-site. The inspector is provided access to DWP SSCs, including tank and vessel internals, as work packages are issued. As a part of the installation certification process the inspector reviews and verifies the results of installation and fabrication work and test and inspections performed by responsible field engineers, field welding engineers, and quality control engineers. The inspector maintains cognizance of construction, erection, installation, inspection and testing activities, but can not perform or witness inspections for all in-process activities for all components. The inspector performs inspections in accordance with a tank installation inspection plan.

3.1 Independent Inspections

WAC 173-303-640(3)(c) and permit conditions require that prior to covering, enclosing, or placing new DWP SSC(s) in use, an independent, qualified, installation inspector or an independent, qualified, registered professional engineer (IQRPE), either of whom is trained and experienced in the proper installation of DWP SSCs, shall have inspected the system for the presence of any of the following items [Permit Conditions III.10. E.3.a. and c., III.10.G.3.a. and c., III.10.H.1.a.iv. and vi., and III.10.J.1.a.iv. and vi].

- weld breaks
- punctures
- scrapes of protective coatings
- cracks
- corrosion
- other structural damage or inadequate construction/installation

Inspections of tanks and miscellaneous units internals are performed on tanks that are large enough and designed for entry to ensure that no damage occurred to the internal piping and other equipment during

shipping and installation. Inspections may occur during final clean checks prior to vessel turn over from construction to start-up.

The following documentation (available in PADC) is considered by the independent qualified installation inspector, or IQRPE, in certifying proper installation of DWP SSCs [Permit Conditions III.10.E.3.g., III.10.G.3.g., III.10.H.1.a.x., and III.10.J.1.a.x.]:

- field installation reports (previously listed Section 2.2)
- approved welding procedures
- welder qualifications and certifications
- tightness test reports in accordance with the codes specified by design
- tester credentials
- inspector credentials
- field inspector reports (previously listed in Section 2.2)
- field waiver reports (i.e.,NCRs, CDRs),
- non-compliance reports, corrective action and repair reports (i.e., NCRs, CDRs)

Procedures for excavation and backfill, concrete placement and system turnover to commissioning and test will have controls to ensure that the independent qualified installation inspector or IQRPE has performed installation inspections and inspections to confirm that discrepancies have been remedied before the DWP SSC is covered, enclosed or placed in use.

3.2 Corrosion Protection Inspection

Installation of the field fabricated cathodic protection system for the underground transfer piping is supervised by a independent corrosion expert to ensure proper installation [Permit condition III.10.E.3.e].

3.3 Certification of Installation

Certified written statements from the independent qualified installation inspector or IQRPE and from the independent corrosion expert will be obtained attesting that the DWP SSCs and field fabricated cathodic protection system were properly installed and any repairs were performed [Permit Conditions III.10.E.1.d, III.10.G.1.d., III.10.H.1.a.iii., III.10.I.1.a.iv., III.10.J.1.a.iii., and III.10.K.1.a.iv.].

The written statements will be maintained and available in the WTP Unit Operating Record [Permit Conditions III.10.E.3.f., III.10.G.3.f., III.10.H.1.a.ix., and III.10.J.1.a.ix.].

4 Summary

Tank systems and miscellaneous unit systems are installed in accordance with the applicable engineering documents and manufacturer's installation instructions. Special instructions for installation requirements that are not skill of the craft are provided in a field installation report developed from the engineering documents or manufacturer's instructions or BNI standard practices or a combination of all. Field installation/inspectors reports, when completed, document the inspections necessary to ensure the quality installation of the DWP SSCs.

Installation and/or process instructions include the following, where applicable:

- rigging instructions
- step-by-step assembly instructions
- welding procedures and conditions
- coatings system installation
- tightness testing
- instructions to prevent damage to the DWP SSC during construction and startup

Installation activities ensure that required inspections by construction inspectors and the independent qualified installation inspector, or IQRPE, are performed before the DWP SSC to be inspected becomes covered, enclosed, or placed in use.