This document was too large to scan as a single document. It has been divided into smaller sections.

Section 3 of 3

Document Information			
Document #	0201741/02-RCA-0272	Revision	
Title	QUARTERLY NOTIFICATION OF CLASS 1 MODIFICATIONS TO THE HANFORD FACILITY RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) PERMIT, DANGEROUS WASTE PORTION (QUARTER ENDING MARCH 31, 2002 - PERMIT CONDITION I.C.3)		
Date	04/09/2002		
Originator	J. HEBDON, R. H. GURSKE, R. D.(ROBY)ENGE	Originator Co.	DOE, FH, PNNL
Recipient	L. E. RUUD	Recipient Co.	DOEC
References			
Keywords			
Projects			
Other Information			

S CPF 18

ESSENTIAL

FMP-CS (Facility Modification Package –Coversheet) (Block 17, 18, 22)*

Section 1: Design Package Identification

1. Mod Title:
Change to ECN-664331

2. USQ Required?	*3. Assigned Lead Engineer:*	*4. Design Authority:*
USQ # N/A CX # N/A	**H.L. Roach**	**S.T. Willett**

5. Project No./Work Package No.:	*6. Area*	*7. Building*	8. System No.:	*Approval Designator:*
EL-00-00712/M	**200E**	**2025E**	60J	**T**

9. Related FMPs/Changes:	10. Incorporates ECN/DCNs:	11. Contract Mod. No.:	12. Change Proposal No.:

13. Lead Engineering Discipline:	14. Affected Engineering Disciplines:

15. Change Description (description and reason for requested change):

Drain pipe upstream of valve 60J-107 needs to be capped. A detail is provided for capping this drain with applicable changes to the P&ID drawing , H-2-88989. In addition a new pipe support is provided to provide more walking space around the Thin Film Dryer (TFD). Details are provided for this new pipe support and for capping the drain line from removed valve PSV-60J212.

Section 2: Document Index:

16. Action	*Document*	*Revision*	*FMP Section*	*Revision*	*FMP Page*	*Release To Work?*
RWC	H-2-88989-1	19	SKT-1	0	12	**Yes**
RWC	H-2-88989-1	19	SKT-2	0	13	**Yes**
I		0	SKT-3	0	14	**Yes**
I		0	SKT-4	0	15	**Yes**
I		0	SKT-5	0	16	**Yes**
+ RWC	ECN-664331, SHT 13	0	SKT-6	0	17	**Yes**
+ RWC	ECN-664331, SHT 15	0	BOM-1	0	18,19	**Yes**

Continuation Sheet Attached? [ ] Yes [x] No

Section 3: Design Authority Concurrence

17. Justification for Accepting or Rejecting Change

Design meets requirements. Design will eliminate problem listed under (15) Change Description

18. Design Authority Approval (Name, Signature, Date):

Name S.T. Willett / Signature / Date 12/12/01

*Block numbers refer to block numbers on the FMP Flowchart (HNF-PRO-2001, Appendix A) and procedure steps within HNF-PRO-2001.

FMP-CS (Facility Modification Package –Coversheet) (Block 17, 18, 22)*

Section 4: Approval/Distribution (Name, Signature, Date)

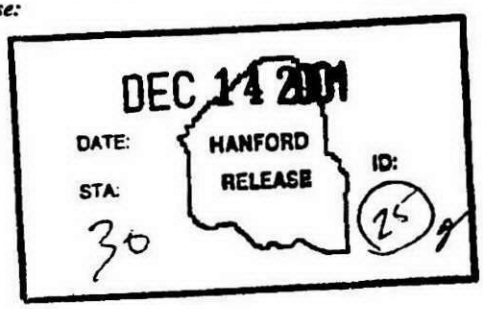
Engineering Approvals	Approval Designator Reviews (Ref. HNF-PRO-233)	Management Reviews
19. Design Engineer (if different from the DA and Lead Engineer) **Same as Lead**	28. Quality Assurance	37. Project Engineer
20. Lead Engineer **H.L. Roach** HL Roach 12/11/01	29. Safety	38. Project Engineering Manager (when different from Engineering Management)
21. *Engineering Management* **K.J. Lueck** 12/11/01 KJ Lueck for K. J. Lueck	30. Environmental	39. Project Manager
22. Squad Check (when required; if more than one discipline involved, sign below)	31. Fire Protection	40. Operations Manager (OM)
23. Other	32. Radiological Control	41. Ergonomics (when required by OM)
24. Other	33. ALARA Review	42. Field Execution Manager / Startup Manager
25. Other	34. Other	43. Other
26. Other	35. Other	44. Other
27. Other	36. Other	45. Other

46. Modification work complete and field verified as complete for the construction activity (Block 22)*

Design Authority _____ Date _____

47. Distribution Name	MSIN
MW Bowman	S6-72
PI Linn	S6-72
KJ Lueck	S6-72
HL Roach *H	S6-72
DE Scully	S6-72
CD Skogley	S6-71
NJ Sullivan	S6-72
RW Szelmeczka	S6-72
DA Vasquez	S6-74
RH Wight	S6-72
ST Willett *H	S6-72
ST Willis	S6-51
WPP Planning *H	S6-71
*H - Advance Hard Copy	

48. Release:



49.
[ ] Not Approved/Archive

_____/_____
Design Authority/Date

*Block numbers refer to block numbers on the FMP Flowchart (HNF-PRO-2001, Appendix A) and procedure steps within HNF-PRO-2001.

FMP-1 (Facility Modification Package—Engineering Request/Evaluation)

Engineering Request (Block 1)*

Requestor	*Date*	Need Date
Marv D Steel	12/04/01	

FMP Title	Building/Room Number/System Number
Request Change to ECN 664331	2025E/131/60J

Problem Statement/Proposed Modification

Drain pipe downstream of valve to be removed under ECN-664331, 60J-107, needs to be capped. In addition a new pipe support is needed to provide more walking space around the Thin Film Dryer (TFD).

Lead Engineer Assigned (Block 2)*

Assigned Lead Engineer (Block 2)*	Date
HL Roach	12/11/01

Approve for Engineering Evaluation (Block 3)*

Work Package Number	Estimated Evaluation Cost
EL-00-00712/M	1 Mhr

Engineering Management		*Date*
KJ Lueck	[X] Yes [ ] No	12/11/01

If not approved, reason not approved:

N/A

* Block numbers refer to block numbers on the FMP Flowchart (HNF-PRO-2001, Appendix A) and procedure steps within HNF-PRO-2001.

FMP-2 (Facility Modification Package – Engineering Evaluation/Estimate)

Engineering Evaluation (Block 4)*

Problem Analysis

Capping of drain line was missed in the original ECN. Operations requests a new pipe support be designed to allow one existing pipe support to be removed to open up the walkway around the Thin Film Dryer.

Alternatives Considered

- Do Nothing
- Make changes requested by operations
-
-

Preferred Solution

Make changes requested by operations

Cost and Schedule Estimate (Block 5)*

Estimated Construction Cost (Materials and Labor)	Estimated Engineering Cost	Total Estimated Cost
$1000	$500	$1500

Approve for Conceptual Phase (Block 6)*

Operations Manager DA Vasquez D. A. Vasquez 12/11/01	[X] Yes [ ] No	***Date***	Cost Account Charge Number 111230
Design Authority ST Willett S. W. Willett	[X] Yes [ ] No	***Date*** 12/11/01	
Engineering Management KJ Lueck K. J. Lueck 12/11/01	[X] Yes [ ] No	***Date***	

If not approved, reason not approved:

N/A

*Block numbers refer to block numbers on the FMP Flowchart (HNF-PRO-2001, Appendix A) and procedure steps within HNF-PRO-2001.

FMP-3A (Facility Modification Package – Preconceptual Plan and Design Documents)		
FMP Plan (Block 4)*		
Preconceptual Phase Plan		
Needed	**Design Input Documents**	**Notes**
	Functional Requirements Document (required for Line Item Projects)	
	Scope Description Document (required for General Plant Projects)	
X	Identify/Review Applicable Codes and Standards	ETF Pipe Class 151 and ASME B31.1
	Applicable Regulatory Requirements	
	Research Vendor Information	
	Make/Buy Decision	
	Resource Plan for Engineering/Project Support	
X	Identify Engineering Drawings	Identified affected P&ID Drawing
	Identify Need for Procurement Specification	
	Identify Need for Construction Specification	
X	Field Measurements	Complete
X	Vendor Information	Complete
Design Analysis Documents		
	Engineering Study	
	Preliminary Design Calculations	
	Preliminary Safety Analysis/USQ Screen	
	Preliminary Environmental (NEPA) Review	
	Structures, Systems, and Components Functional Analysis	
X	Authorizations Bases Review Form (ABR) (WMH-331, Rev 2, 3.12)	Not applicable inconsequential change per WMH-331.

*Block numbers refer to block numbers on the FMP Flowchart (HNF-PRO-2001, Appendix A) and procedure steps within HNF-PRO-2001.

FMP-3B (Facility Modification Package – Conceptual Plan)		
FMP Plan (Block 7)*		
Conceptual Phase Plan		
Needed	**Document**	**Notes**
X	Design Criteria	Meet ETF pipe class 151
X	List of Baseline Documents to be modified	FMP-4
X	List of Affected Documents	FMP-5
X	Design Verification Method/Plan	Peer review
X	Applicable Codes and Standards	Design per pipe class and ASME B31.1
	Conceptual Design Cost and Schedule	
	Preliminary USQ Screen	
	Environmental Screen/NEPA	
	Preliminary Job Hazard Analysis/Automated Job Hazard Analysis (AJHA)	
	Formal Hazards Analysis (if required)	
	Preliminary Safety Analysis Report	
	Identify/Review Fire Hazards Analysis (FHA)	
	Identify/Review Criticality Safety Evaluation Report (CSER)	
	Perform Preliminary ALARA, Ergonomics, and Safety Review	
	3rd Party Inspector Review (e.g. NEC, Water Purveyor, Pressure Vessel)	
	Engineering Walkdowns/Surveys	
X	Drawing Searches	To identify required changes to P&ID
	Plant Forces Work Review	
	System Design Description	
	Long-Lead Equipment Specifications/Procurement	
	Identify Construction Work Authorization Envelope	
	Identify need for Interface Control Documents/ Memoranda of Understanding/Memoranda of Agreement	
	Identify need for Engineering Work Plan	
	Prepare Formal Conceptual Design	
	Prepare Quality Assurance Plan (Required for Line Items/General Plant Projects)	

*Block numbers refer to block numbers on the FMP Flowchart (HNF-PRO-2001, Appendix A) and procedure steps within HNF-PRO-2001.

FMP-3C (Facility Modification Package – Execution Plan)			
FMP Plan (Block 7)*			
Execution Phase Plan			
Detail Design			
Other Design Input Documents			
Needed	**Document**		**Notes**
X	Vendor Information		B-Line components for pipe support
Other Design Analysis Documents			
	Design Calculations		
X	Job Hazards Analysis/Automated Job Hazard Analysis		In work package
X	Design Verification		FMP-7
Design Output Documents			
	Detailed Design Drawings		
	Final USQ Screen		
	Procurement Specification		
	Construction Specification		
X	Acceptance Test Plan / Inspection Plan		In work package
X	Installation Instructions		SKT-3, -4, -5
X	Bill of Materials		BOM-1
	Required Permits		
		Hot Work Permit	
		Excavation Permit	
		Confined Space Permit	
		Radiation Work Permit	
		Elevated Work Permit	
X	Work Package		EL-00-00712/M
	Redline Drawing Set (s)		
Acceptance Testing and Turnover			
X	Acceptance Testing		In work package
	3rd Party Inspector Review (e.g. NEC, Water Purveyor, Pressure Vessel)		
	As-Built Set of Drawings		
	Punchlist		
X	Piping shall be inspected and tested per ASME B31.1		

*Block numbers refer to block numbers on the FMP Flowchart (HNF-PRO-2001, Appendix A) and procedure steps within HNF-PRO-2001.

FMP-4 (Facility Modification Package – Engineering Documents to be Modified)			
List of Engineering Documents to be Modified (Block 7)*			
Document Number (Sheet/Pages, Rev)	**Title**	**Outstanding ECN(s) DCN(s)/FMP(s)**	**Work Complete?**
H-2-88989-1 /Rev 19	PIPING & INSTM DIAG THIN FILM DRYER	ECN-656781L	YES (Mod work under this FMP and Original ECN will Close out this Temporary ECN)
		ECN-662046	NO
		ECN-664330	NO
		ECN-664331	NO
ECN-664331 /Rev 0	INSTALL NEW SPOOL PIECE ON THIN FILM DRYER LINE	N/A	N/A

Submit to Document Control? (Block 10)*

[ ] Yes [X] No	Lead Engineer HL Roach HJ Roach	Date 12/11/01

*Block numbers refer to block numbers on the FMP Flowchart (HNF-PRO-2001, Appendix A) and procedure steps within HNF-PRO-2001.

FMP-5 (Facility Modification Package – Potentially Affected Documents)			
Potentially Affected Document (Blocks 7)*			
Document Number/Revision	**Document Owner (organization)**	**Technical Authority Notified**	**Date Notified**
N/A	N/A	N/A	N/A

*Block numbers refer to block numbers on the FMP Flowchart (HNF-PRO-2001, Appendix A) and procedure steps within HNF-PRO-2001.

FMP-6 (Facility Modification Package – Preliminary Evaluations/Functional Requirements)

Perform Preliminary Evaluations (Block 8)*

A new pipe stand will be designed to support pipelines ¾"-1B-031-151, ¾"-95D-015-155, and the 1-1/2" drain line connection to (removed) valve PSV-60J212. New pipe support will allow for an existing pipe support to be removed and will provide an additional 13" walk way clearance around the Thin Film Dryer. Pipe load on the new support is minimal so stress analysis is not required.

The drain pipe upstream from valve 60J-107 needs to be capped. To make it easier to reuse this drain in the future a plug will be installed at the existing union connection just upstream from valve 60J-107. An additional change to the P&ID, H-2-88989-1 is required.

Functional Requirements, Design Criteria, and Acceptance Criteria (Block 9)*

Pipe components must meet the requirements of ETF pipe Class 151 as specified in the ADTECHS pipe class specification document S-136H-001.

Detailed Conceptual Design Document Required? **(Block 11)** **[ ] Yes [X] No**

Design Authority **ST Willett**	***Date*** 12/11/01
(If Conceptual Design Document Required) ***Engineering Management*** **N/A**	***Date*** **N/A**

*Block numbers refer to block numbers on the FMP Flowchart (HNF-PRO-2001, Appendix A) and procedure steps within HNF-PRO-2001.

FMP-7 (Facility Modification Package – Detailed Design/Verification)

Design Verification Record (Block 15)* [See drawings, calculations, specifications, and other design products]

Design Verification Method (Select method(s) and provide explanation of how to be performed):

[X] ***Peer Review***

[ ] ***Formal Design Review***

[ ] ***Alternate Calculations***

[ ] ***Qualification Testing***

Design Authority	***Date***
ST Willett ST Willett	12/11/01

Design Verification Details

Design satisfies design requirements and meets ETF pipe class requirements.

Design Verifier	***Date***
ST Willett ST Willett	12/11/01

*Block numbers refer to block numbers on the FMP Flowchart (HNF-PRO-2001, Appendix A) and procedure steps within HNF-PRO-2001.

FMP-8 (Facility Modification Package - Continuation Page)

FMP Section Title	SKT-1	Date 12/06/01	H-2-88989-1/Rev 19

"WAS"

3 -60J-148-153SV

3 -45D-020-153S

VESSEL VENTILATION SYSTEM
H-2-88993
ZN B6

3 -60J-144-153SV

AO
AOV
60J159

SECONDARY WASTE RECEIVING TANK (A)
H-2-88986
ZN B8

1/2 -60J-202-163LV

60J-108 C-5

60J-118 C-5

B-5

60J-107 E-7

PSE-60J213 D-4

PSN-60J211 D-7

AOV-60J160 B-6

2 -60J-158-153S

SUMP TANK 1
H-2-88991
ZN E2

FI
60J035

PI 150
TI 200

SP

FT
60J035

60J035-A

60J035-B

NOTES

1 BOILER STEAM CONDENSATE & COOLING WATER PIPING IS ANSI B31 1 ALL OTHER PIPING IS B31 3

2 SEE FOLLOWING DOCUMENT FOR DRYER SKID PIPING MATERIAL V-135A-005-701

3 "V ADDED TO VENDOR PIPING DESIGNATION FOR CLARITY

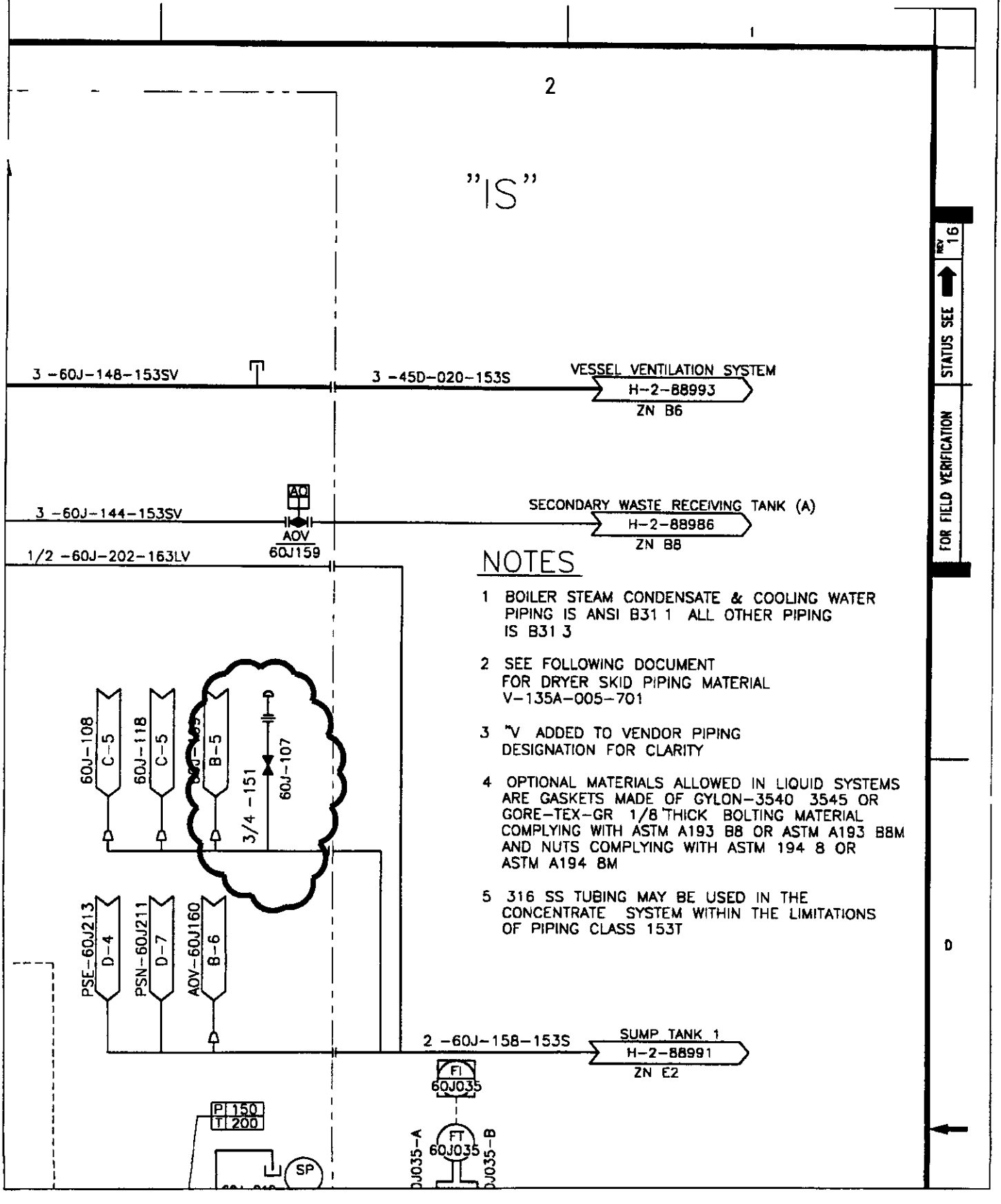
4 OPTIONAL MATERIALS ALLOWED IN LIQUID SYSTEMS ARE GASKETS MADE OF GYLON-3540 3545 OR GORE-TEX-GR 1/8 THICK BOLTING MATERIAL COMPLYING WITH ASTM A193 B8 OR ASTM A193 B8M AND NUTS COMPLYING WITH ASTM 194 8 OR ASTM A194 8M

5 316 SS TUBING MAY BE USED IN THE CONCENTRATE SYSTEM WITHIN THE LIMITATIONS OF PIPING CLASS 153T

REV 16 STATUS SEE FOR FIELD VERIFICATION

FMP-8 (Facility Modification Package – Continuation Page)

FMP Section Title	SKT-2	Date 12/06/01	H-2-88989-1/Rev 19



NOTES

1 BOILER STEAM CONDENSATE & COOLING WATER PIPING IS ANSI B31 1 ALL OTHER PIPING IS B31 3

2 SEE FOLLOWING DOCUMENT FOR DRYER SKID PIPING MATERIAL V-135A-005-701

3 "V ADDED TO VENDOR PIPING DESIGNATION FOR CLARITY

4 OPTIONAL MATERIALS ALLOWED IN LIQUID SYSTEMS ARE GASKETS MADE OF GYLON-3540 3545 OR GORE-TEX-GR 1/8 THICK BOLTING MATERIAL COMPLYING WITH ASTM A193 B8 OR ASTM A193 B8M AND NUTS COMPLYING WITH ASTM 194 8 OR ASTM A194 8M

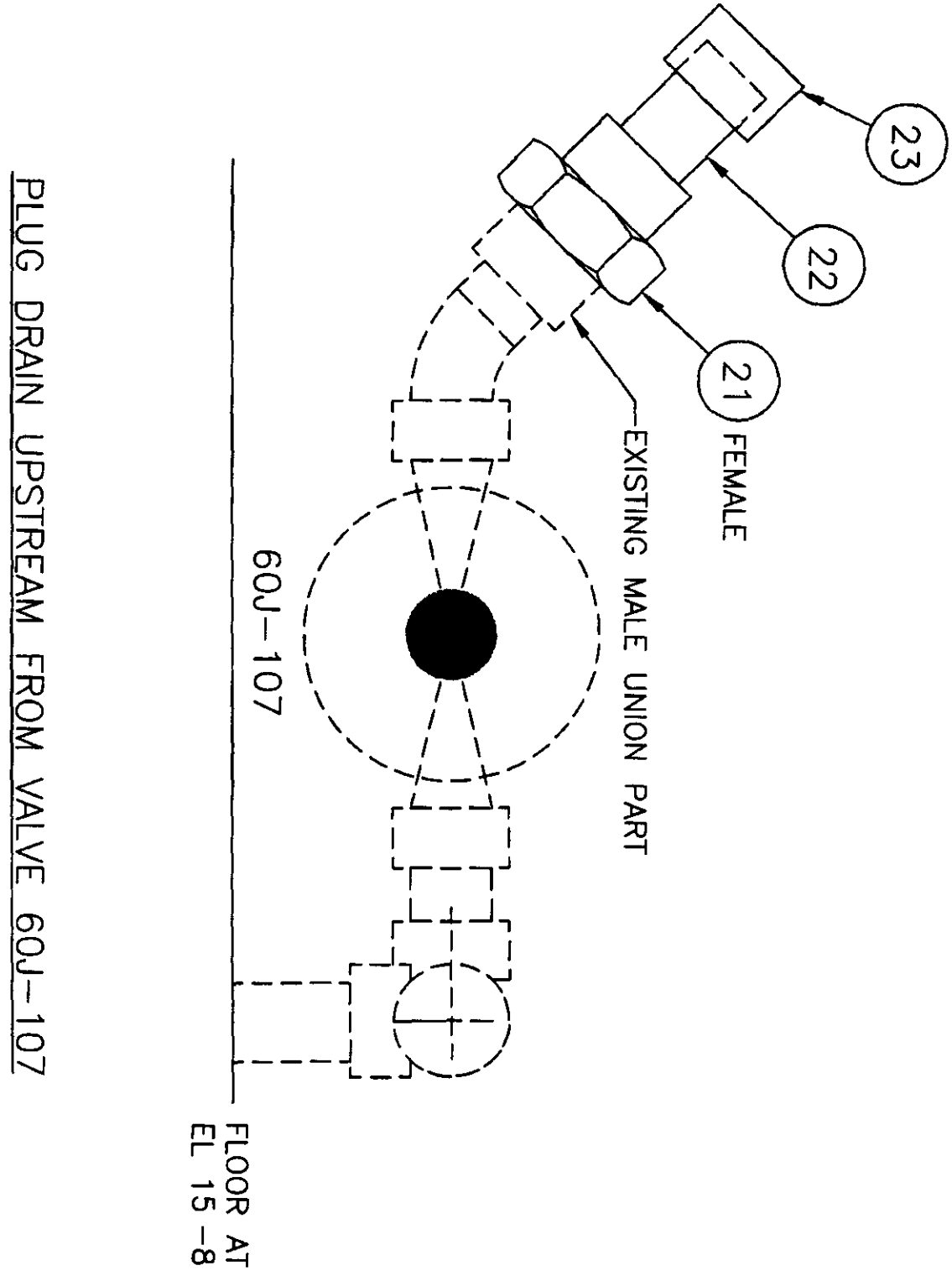
5 316 SS TUBING MAY BE USED IN THE CONCENTRATE SYSTEM WITHIN THE LIMITATIONS OF PIPING CLASS 153T

FMP 8 (Facility Modification Package Continuation Page)

FMP Section Title	SKT 3	Date 12/06/01	

ASSEMBLY SKETCH
NOT FOR DRAWING INCORPORATION

DIMENSIONS SHOWN ARE APPROXIMATE
FIELD VERIFY AND ADJUST AS NECESSARY



FMP-8 (Facility Modification Package – Continuation Page)

FMP Section Title	SKT-4	Date 12/06/01	

ASSEMBLY SKETCH
NOT FOR DRAWING INCORPORATION

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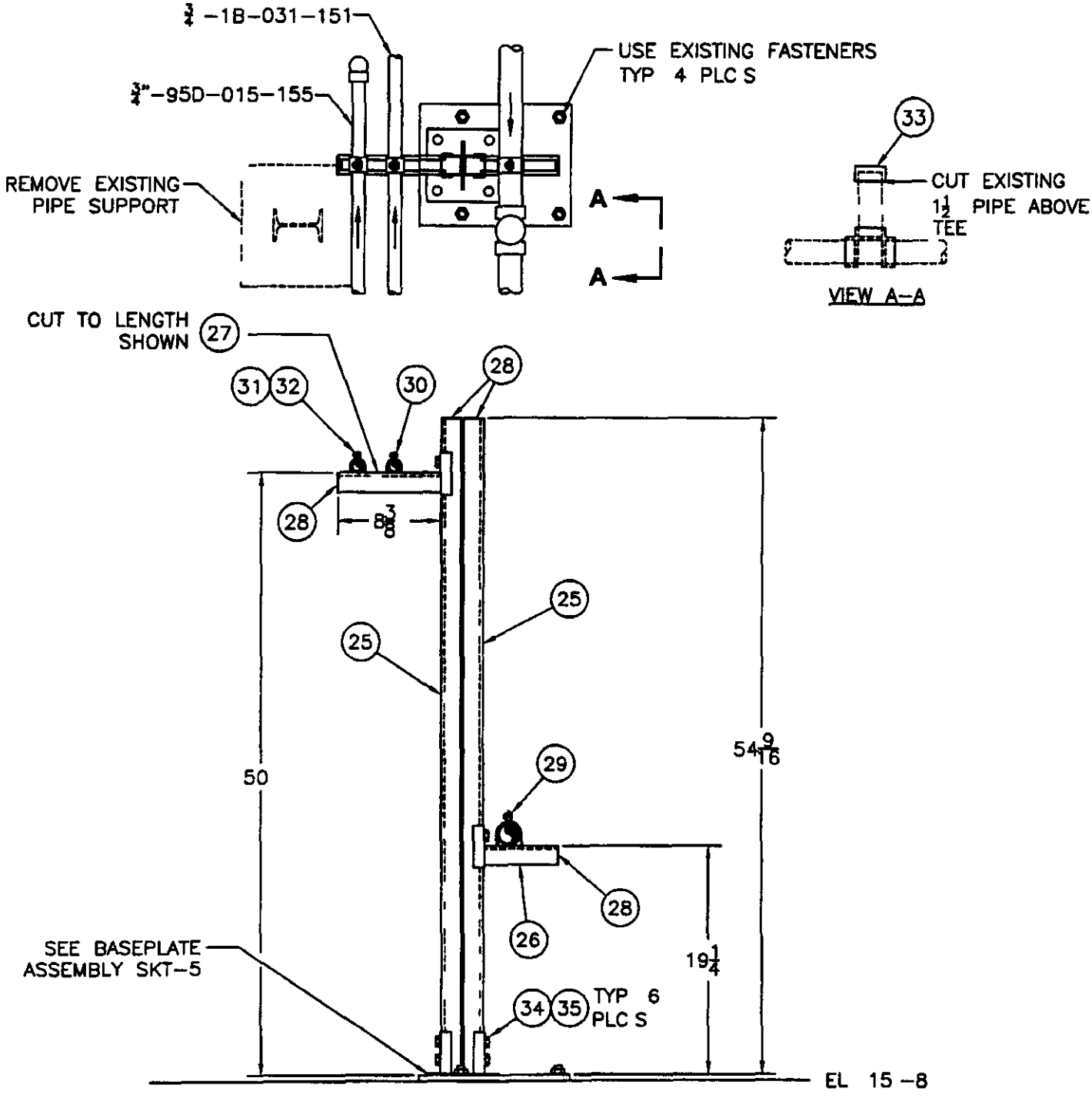
FIELD VERIFY AND ADJUST AS NECESSARY



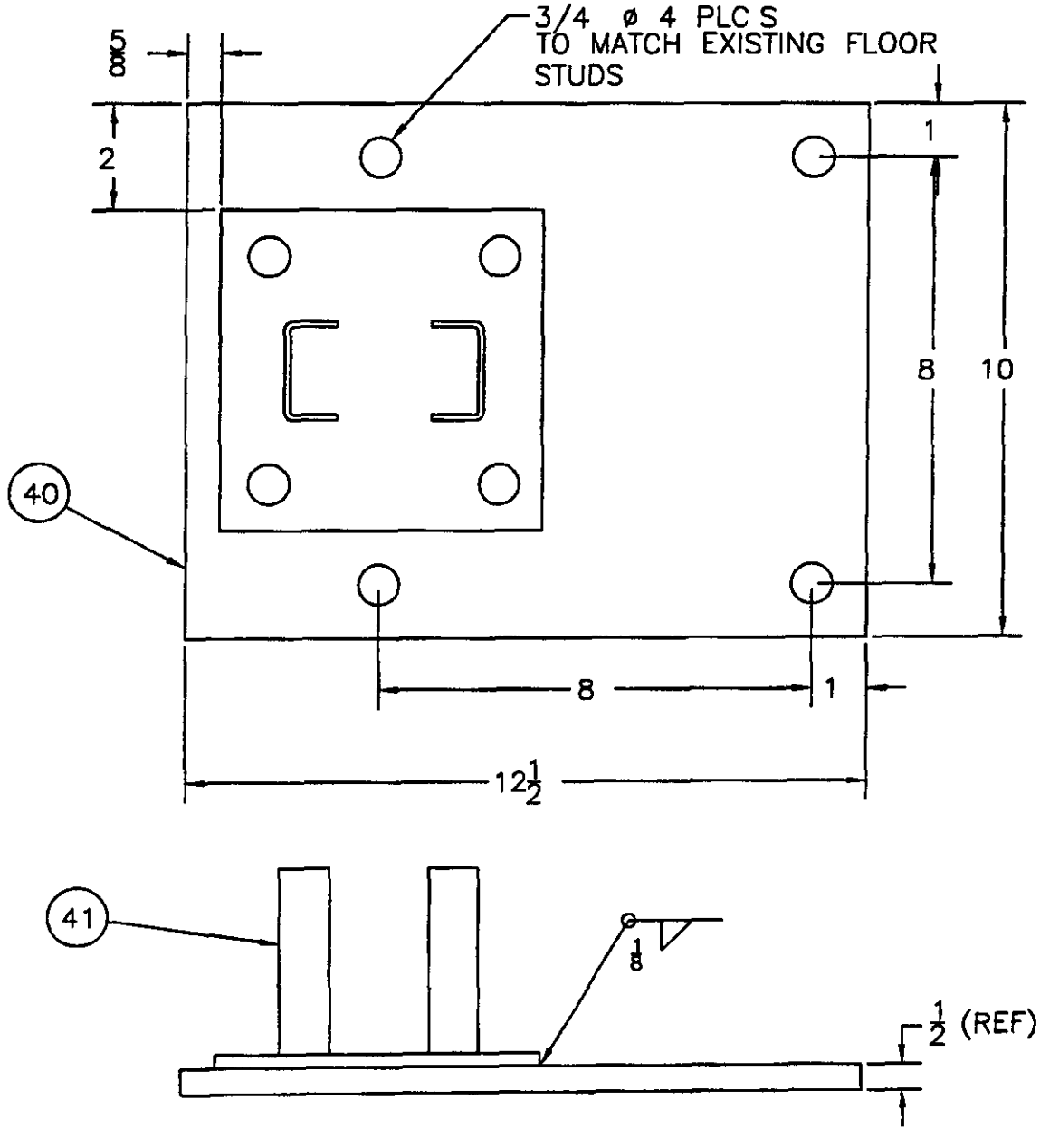
NEW PIPE SUPPORT ASSEMBLY

FMP-8 (Facility Modification Package – Continuation Page)

FMP Section Title	SKT-5	Date 12/06/01	

ASSEMBLY SKETCH
NOT FOR DRAWING INCORPORATION

DIMENSIONS SHOWN ARE APPROXIMATE
FIELD VERIFY AND ADJUST AS NECESSARY



BASEPLATE ASSEMBLY

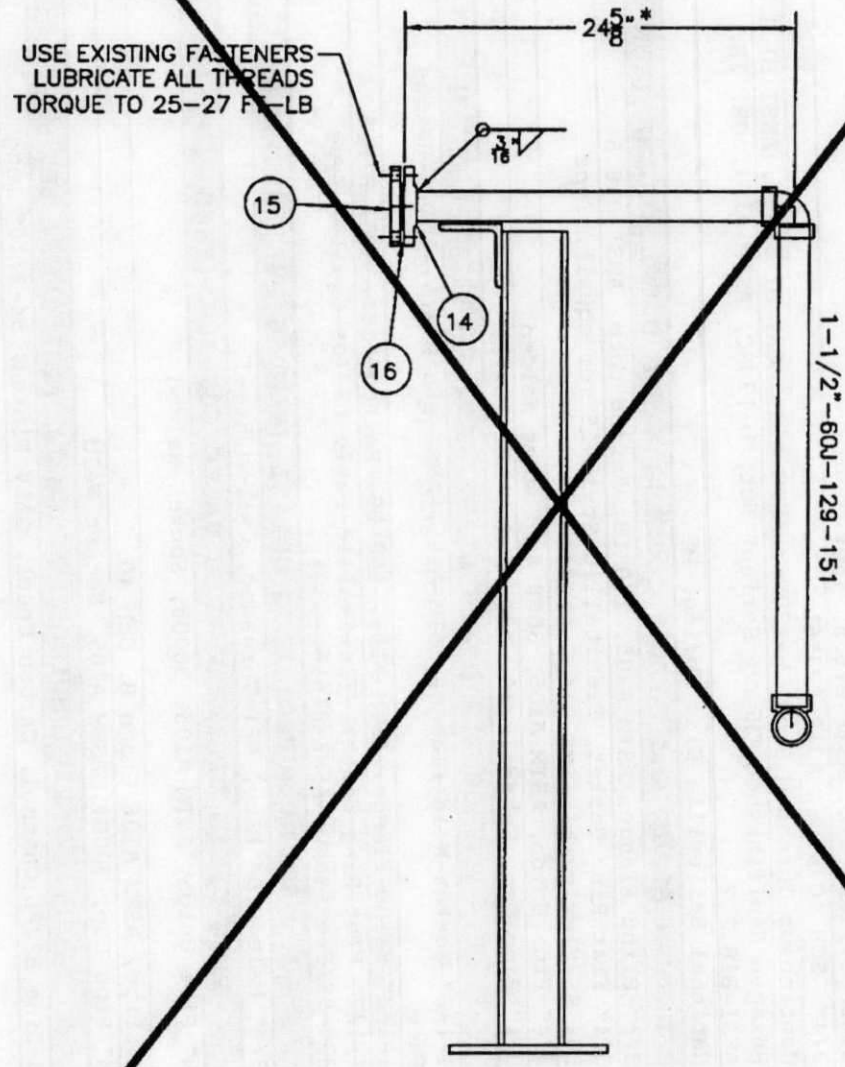
FMP-8 (Facility Modification Package – Continuation Page)

FMP Section Title: SKT-6	Date: 12/06/01	

PAGE 13 OF 15

ENGINEERING CHANGE NOTICE CONTINUATION SHEET	DOCUMENT NO. N/A	DATE 9/24/01	ECN 664331

ASSEMBLY SKETCH
NOT FOR DRAWING INCORPORATION
DIMENSIONS SHOWN ARE APPROXIMATE
FIELD VERIFY AND ADJUST AS NECESSARY



PSV-60J212 DRAIN BLANK

* CUT EXISTING PIPE TO APPROXIMATE DIMENSION SHOWN.

DELETE SHEET 13 FROM ORIGINAL ECN 664331

REPLACE PAGE 15, ECN 664331, WITH THIS REVISED PARTS LIST

NOT FOR DRAWING INCORPORATION

ITEM	QUANTITY	Description	Notes
		TFD FEED LINE SPOOL PIECE (ECN 664331, PAGE 11)	
1	2	3/4" Welding Neck Flange, SCH 40, Raised Face, 150 #, ASME B16.5, ASTM A182-F316L	
2	2	3/4" 90° Elbow, Seamless Butt Weld Ends, SCH 40, 316L SS	
3	2	3/4" Flat Ring Gasket, Flexitallic Style LS (or equal), Type 316L SS/Flexicarb, ASME B16.5, 150#	
4	~6"	3/4" SCH 40 Pipe, A312 TP316L	
5	AR	Continuous Threaded Stud, ½-13UNC, ASTM A193, GR. B7 Steel, ANSI B1.1	
6	AR	Hexagon Semifinished "Heavy Series" Nut, ½-13UNC, ASTM A194, GR. 2H, ANSI B18.2.2	
7	AR	National Belleville Disc Spring, ½"	
		CONDENSATE RETURN BLANK and 60JE-2 COOLING WATER SUPPLY BLANK (ECN 664331, PAGE 12)	
10	1	3/4" Blind Flange, ASTM A105, 150 LB. Raised Face, ANSI B16.5	
11	1	3/4" Flat Ring Gasket, Flexitallic Style LS (or equal), Type 304 SS/Flexicarb, ASME B16.5, 150#	
12	2	3/4" Pipe Union, ASTM A105, 3000 #, Socket Welded	
13	2	3/4" Pipe Cap, Schedule 40, ASTM A234, Butt Welded	
		PSV-60J212 DRAIN BLANK (ECN 664331, PAGE 13)	
~~14~~	~~1~~	~~1-1/2" Socket Weld Flange, ASTM A105, ANSI std B16.5, 150 # Raised Face~~	
~~15~~	~~1~~	~~1-1/2" Blind Flange, ASTM A105, 150 LB. Raised Face, ANSI B16.5~~	
~~16~~	~~1~~	~~1-1/2" Flat Ring Gasket, Flexitallic Style LS (or equal), Type 304 SS/Flexicarb, ASME B16.5, 150#~~	
		STEAM SUPPLY PLUG DETAIL (ECN 664331, PAGE 14)	
17	1	3/4" Male Pipe Plug, NPT Threaded, Carbon Steel	
		PLUG DRAIN UPSTREAM FROM VALVE 60J-107 (THIS FMP, SKT-3)	
21	1	¾" Pipe Union, ASTM A105, 3000#, Socket Welded	Use female part only - Mates to existing male part
22	2"	¾" Pipe, ASTM A106 Grade B, Sch 40,	
23	1	¾" Pipe Cap, 3000#, ASTM A105, Socket Weld	
		NEW PIPE SUPPORT ASSEMBLY (THIS FMP, SKT-4)	
25	2	B-Line B22PL Channel, Carbon Steel, GALV Finish, 54-9/16" Long	

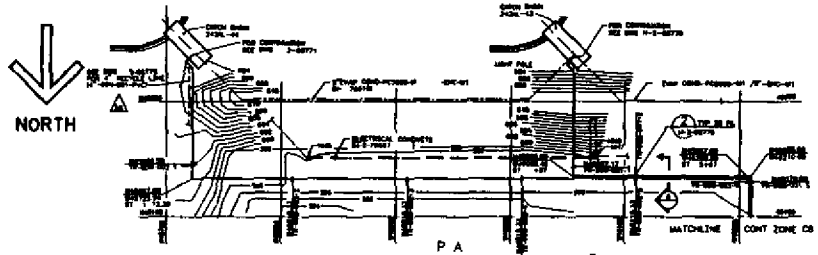
REPLACE PAGE 15, ECN 664331, WITH THIS REVISED PARTS LIST

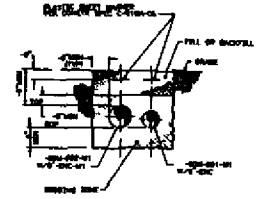
NOT FOR DRAWING INCORPORATION

26	1	B-Line B198 Channel Clevis Bracket, 6" Long, Carbon Steel, ZN Finish, B-Line Part Number B198-6	
27	1	B-Line B198 Channel Clevis Bracket, 8-3/8" Long, Carbon Steel, ZN Finish, B-Line Part Number B198-12 (12" Long as ordered)	
28	4	B-Line Plastic End Caps for B-Line Channel, B-line # B825-22 GRN	
29	1	B-Line Pipe Clamp, 1-1/2" Pipe Size, B-Line # B2012, Carbon Steel, ZN Finish	
30	1	B-Line Pipe Clamp, 3/4" Pipe Size, B-Line # B2009, Carbon Steel, ZN Finish	
31	1	B-Line Pipe Clamp, 1-1/4" OD Size, B-Line # B2031, Carbon Steel, ZN Finish	
32	1	B-Line Vibra Cushion, 3-1/4" Length, For Use With Item #31 (Above), B-Line # B1999	
33	1	1-1/2" Pipe Cap, 3000#, ASTM A105, Socket Welded	
34	6	½"-13UNC X 1" Long Hex Head Cap Screw, Grade 5	
35	6	B-Line Channel Spring Nut, ½"-13UNC, B-Line # N225	
BASEPLATE ASSEMBLY (THIS FMP, SKT-5)			
40	1	½" Carbon Steel Plate, 10" x 12-1/2"	
41	1	B-Line Post Base for B22-2PL Channel, B-Line # B281MSQ, Plain Finish Preferred, ZN finish acceptable	

Trademarks:

Flexicarb - Flexitallic Limited Corporation
Flexitallic - "Flexitallic" Gasket Company Corporation
B-Line - Sigma-Aldrich Co. CORPORATION





GE ERAL NO ES

MA ERIAL ABRICA ION, INSTALLATION EXAMINATION, TESTING AND CLEANING SHALL BE ACCORDANCE WITH CONSTRUC ION SPEC CA ION CO 8H-C6 AND DRAWINGS.

TOLERANCES, UNLESS THERWISE NOTED, SHALL BE.
FRAC IONAL ±
ANGULAR ±
PELINE LOCATIONS ±3"
PELINE ELEV ION -6" ELEVATION ESTAB ISHED SHALL BA NT SPELINE SLOPE BA SED ON 1" ON BOP ELEV IONS SHOWN

PE SUPPORT GCA ION, AS ALL

(PE-XX-00) INDICA ES PE SUPPORT SEE DRAWING H- 8877 AND H-2 8877

FOR LEGEND AND SYMBOLS SEE DRAWING H-2-88765

ALL BURIED LINES SHALL HAVE MINIMUM EARTH COVER MEASURED FROM TOP OF PE OR ENCASEMENT

CONTRACTOR SHALL VERIFY IMENSIONS OF IST NG PIPING PRIOR TO FABRICA ON AND NS ALLA ON

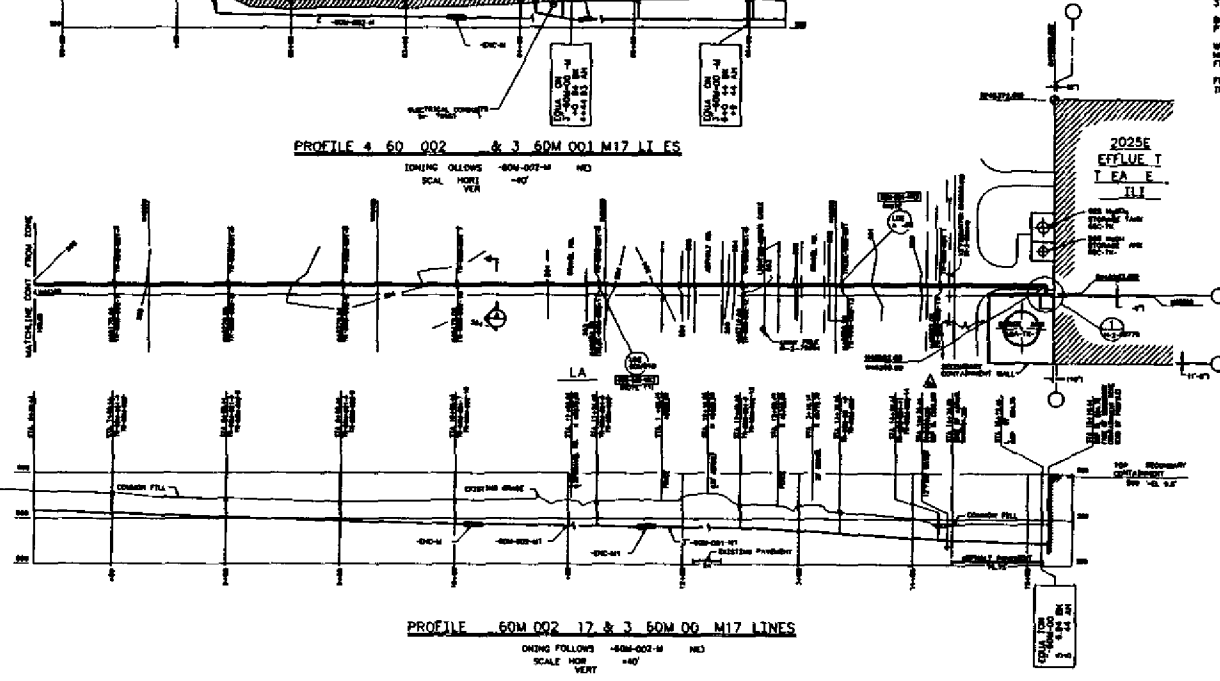
VALVES AND TEST SERS SHALL BE ACCED WITH WIRED-ON ST NLESS STEEL AG WITH APPROPRIABLE ALVE OR SER AS SHOWN ON DRAWING(S) IDENTIFICA ON LET ERS OR NUMBERS SHALL BE MADE (¼ NG 5/8" MINIMUM CHARACTER ES. THE WERE SHALL BE NLESS STEEL.

SLEEVES THROUGH THE ALVE AREA WALL FOR LINES -60M-002-M 3"-60M-00 -M AND SPARE, ARE BY OTHERS.

BOP ELEV ITONS SHOWN ON DRAWINGS ARE THE BOTTOM OF THE ENCASED PIPE, EXCEPT WHERE NO ENCASEMENT EXIST

WHEN PIP NG ENTERS THE GROUND, HE MIN RADE AND IMBOLA ION SHALL NO BE TRW RATED UNTIL THERE IMUM EARTH COVER MEASURED FROM TOP OF PE OR ENCASEMEN

FOR PREFABRICATED IPING ASSEMB, SEE PROCUREMENT SPEC C-0 8H-P2, INS ALL 3H SER POI -888 SH2 DET



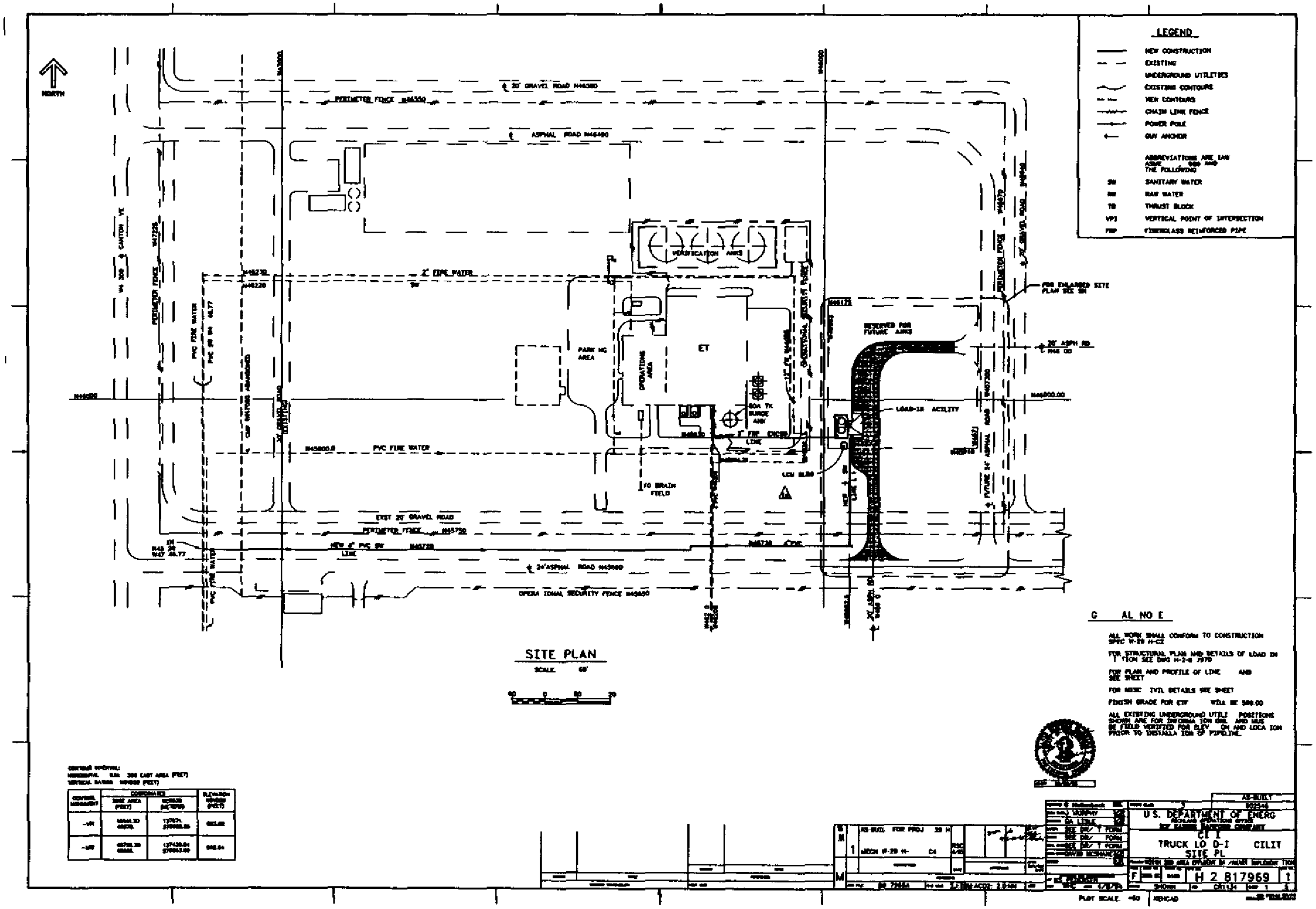
PROFILE 4 60 002 & 3 60M 001 M17 LI ES

IONING OLLOWS -60M-002-M NO
SCAL HORI
VER

PROFILE 60M 002 17 & 3 60M 00 M17 LINES

ONING FOLLOWS -60M-002-M NO
SCALE HOR
VERT

S D RTME T OF ENERG
KAISER ENGINEERS HANFORD COMPANY
I I G
LA ROFILE
60M-002 60M 00
242-A EVAP/RUNEX PLANT CHEM STWT ACIL
H 2 88768
SHOWN CO 8H
PLO SCALE =100 MICAD



NORTH
LEGEND
NEW CONSTRUCTION
EXISTING
UNDERGROUND UTILITIES
EXISTING CONTOURS
NEW CONTOURS
CHAIN LINK FENCE
POWER POLE
GUY ANCHOR
SW SANITARY WATER
RW RAW WATER
TB THRUST BLOCK
VPI VERTICAL POINT OF INTERSECTION
FRP FIBERGLASS REINFORCED PIPE
20' GRAVEL ROAD
PERIMETER FENCE
ASPHAL ROAD
VERIFICATION ANKS
PVC FIRE WATER
ET
OPERATIONS AREA
PARK NG AREA
RESERVED FOR FUTURE ANKS
LOAD-IN ACILITY
FOR ENLARGED SITE PLAN SEE SH
20' ASPH RD
FUTURE 24' ASPHAL ROAD
EXST 20' GRAVEL ROAD
24' ASPHAL ROAD
OPERA IONAL SECURITY FENCE
SITE PLAN
G AL NO E
ALL WORK SHALL CONFORM TO CONSTRUCTION SPEC W-29 H-C2
FOR STRUCTURAL PLAN AND DETAILS OF LOAD IN T TION SEE DWG H-2-8 7979
FOR PLAN AND PROFILE OF LINE AND SEE SHEET
FOR MISC IVIL DETAILS SEE SHEET
FINISH GRADE FOR ETF WILL BE 500.00
ALL EXISTING UNDERGROUND UTILI POSITIONS SHOWN ARE FOR INFORMA ION ONL AND MUS BE FIELD VERIFIED FOR ELEV ON AND LOCA ION PRIOR TO INSTALLA ION OF PIPELINE.
AS-BUILT
U.S. DEPARTMENT OF ENERG
TRUCK LO D-I CILIT
SITE PL
H 2 817969
SHOWN
PLOT SCALE

ENGINEERING CHANGE NOTICE

1 ECN ~~614443~~

Proj ECN W-291H-~~8~~/15

FILE COPY 10

2 ECN Category (mark one)	3 Originator's Name Organization, MSIN and Telephone No	4 Date
Supplemental [X] Direct Revision [ ] Change ECN [ ] Temporary [ ] Standby [ ] Supersedure [ ] Cancel/Void [ ]	Joe Murphy, ICF KH, ER & SW, G3-17, 373-0867	9-19-94
	5 Project Title/No /Work Order No: W-291H 200 AREA BAT/AKART IMPLEMENTATION	6 Bldg /Sys /Fac No: ETF TRUCK LOAD IN FACILITY
	7 Approval Designator: N/A	
8 Document Numbers Changed by this ECN (includes sheet no and rev): H-2-817969 SHT 1,2,3,4,5 H-2-817975 SHT 1 Construction Spec W-291H-C2	9 Related ECN No(s): W291H-~~8~~/10	10 Related PO No: N/A/SC/3

11a Modification Work	11b Work Package No	11c Modification Work Complete	11d Restored to Original Condition (Temp or Standby ECN only)
[ ] Yes (fill out Blk 11b) [ ] No (NA Blks 11b unknown 11c, 11d)	UNKNOWN	N/A Cog Engineer Signature & Date	N/A Cog Engineer Signature & Date

12 Description of Change SC/3

ITEM 1 DWG H-2-817969 SHT 1

a ZONE C-4, Change alignment of line and add line as shown in sketch on page 5

ITEM 2 DWG H-2-817969 SHT 2

a Zone DE-3,4, Change alignment of line L-1 and add 4" line as shown in sketch on page 6

b Zone A8-7, Change and add line to profile as shown in sketch on page 7

c Zone D-7, Change notes as shown in sketch on page 8

d Zone B-6, Change detail as shown in sketch on page 8 Related ECN W291H-~~8~~/10

e Zone B-1, Change note 3 to read as follows

3 The 4" PVC pipe for line L-1 shall be IAW pipe code A or B of section 02650 of the spec

SEE CONTINUATION SHEET PAGE 3

13a Justification (mark one)							
As Found	[X]	Criteria Change	[ ]	Design Improvement	[X]	Environmental	[ ]
		Facilitate Const	[X]	Const Error/Omission	[ ]	Design Error/Omission	[X]

13b Justification Details

See Continuation Sheet Page 4

14 Distribution (include name MSIN and no of copies)

ICF KH DISTRIBUTION		J	D	Fulcher	S2-32
Const Doc Cntl	S2-53	O	M	Jaka	R3-08
		E	A	McNarma	K6-90
WHC DISTRIBUTION		K	S	Pedersen (COG)	R3-35
Project Files	R1-28	J	H	Rasmussen	T6-20
M C Arntzen Jr	L4-93	B	T	Tabayoyon	R3-35
J K Epperley	R1-29	R	L	Veilleux	T3-28

RELEASE STAMP

OFFICIAL RELEASE BY WHC (5)

DATE SEP 27 1994

Sta. 4

7900 013 2 (06/94) GEF095

A-7900-013-1 (04/94)

ENGINEERING CHANGE NOTICE

1 ECN (use no. from pg. 1) W291H-E7315 DSM/EA 9/22/94

15 Design Verification Required	16 Cost Impact				17 Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $ 0	Additional	[] $ 5K	Improvement	[] N/A
[] No	Savings	[] $	Savings	[] $	Delay	[]

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

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

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

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

20 Approvals

	Signature	Date		Signature	Date
OPERATIONS AND ENGINEERING			ARCHITECT ENGINEER		
Cog. Eng.	[signature]	9/22/94	PE	[signature]	9-22-94
Cog. Mgr.	[signature]	9/22/94	QA	N/A DSM	9-22-94
QA			Safety	N/A DSM	9-22-94
Safety			Design	[signature]	9-22-94
Environ.			Environ.	N/A DSM	9-22-94
Other			Other		
			DEPARTMENT OF ENERGY		
			Signature or a Control Number that tracks the Approval Signature		
			ADDITIONAL		

GEM/Sig. 9/21/94

ENGINEERING CHANGE NOTICE CONTINUATION SHEET	Page 3 of 10	ECN W-291H-C2/15
		Date 9/19/94

1. DESCRIPTION OF CHANGE CONT

ITEM 3 DWG H-2-817969 SHT 3
a Zone B-6,7, Remove gate and change notes as shown in sketch on page 9

ITEM 4 DWG H-2-817969 SHT 4
a Zone DEF-1,2,3,4, Remove TYP FENCE DETAIL and associated NOTES

ITEM 5 DWG H-2-817969 SHT 5
a Zone C-6, Add conduit to detail as shown in sketch on page 10

ITEM 6 DWG H-2-817975 SHT 1
a Zone C-1, Change note 6 to read as follows

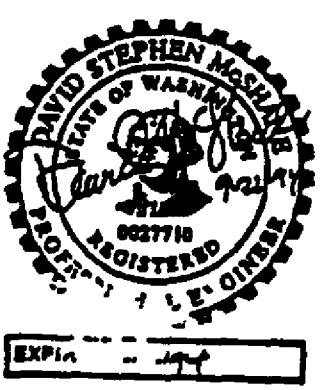
6 Pumps shall be supplied by ICF KH and installed by the Contractor IAW manufacturer's recommendations

ITEM 7 CONSTRUCTION SPECIFICATION W-291H-C2, SECTION 02831
a Delete Section 02831, Chain Link Fences and Gates

ITEM 8 CONSTRUCTION SPECIFICATION W-291H-C2, SECTION 02831

a Pipe Code A Delete, FLEXIBLE COUPLINGS COMPRESSION TYPE SLIP ON STEEL, DRESSER TYPE 38 OR 138

b Pipe Code C Add, FLEXIBLE COUPLINGS COMPRESSION TYPE SLIP ON STEEL, DRESSER TYPE 38 OR 138



EXPIRES

13b JUSTIFICATION DETAILS

ITEM 1
a AF, Sanitary Water line must be moved to avoid leak detection risers installed by project C-018 4 lined installed by project C-018 is added

ITEM 2
a AF, Same as Item 1a
b AF, 4" line installed by C-018 crosses line L-2 and is added to profile
c DI, Redundancy in note is removed
d FC, Pipe material as called out on the drawing made fabrication of pipe expensive and time consuming

ITEM 3
a AF, Fence is no longer necessary, therefore installation of a gate is not needed

ITEM 4
a AF, Fence is no longer necessary, therefore the installation of a gate is not needed

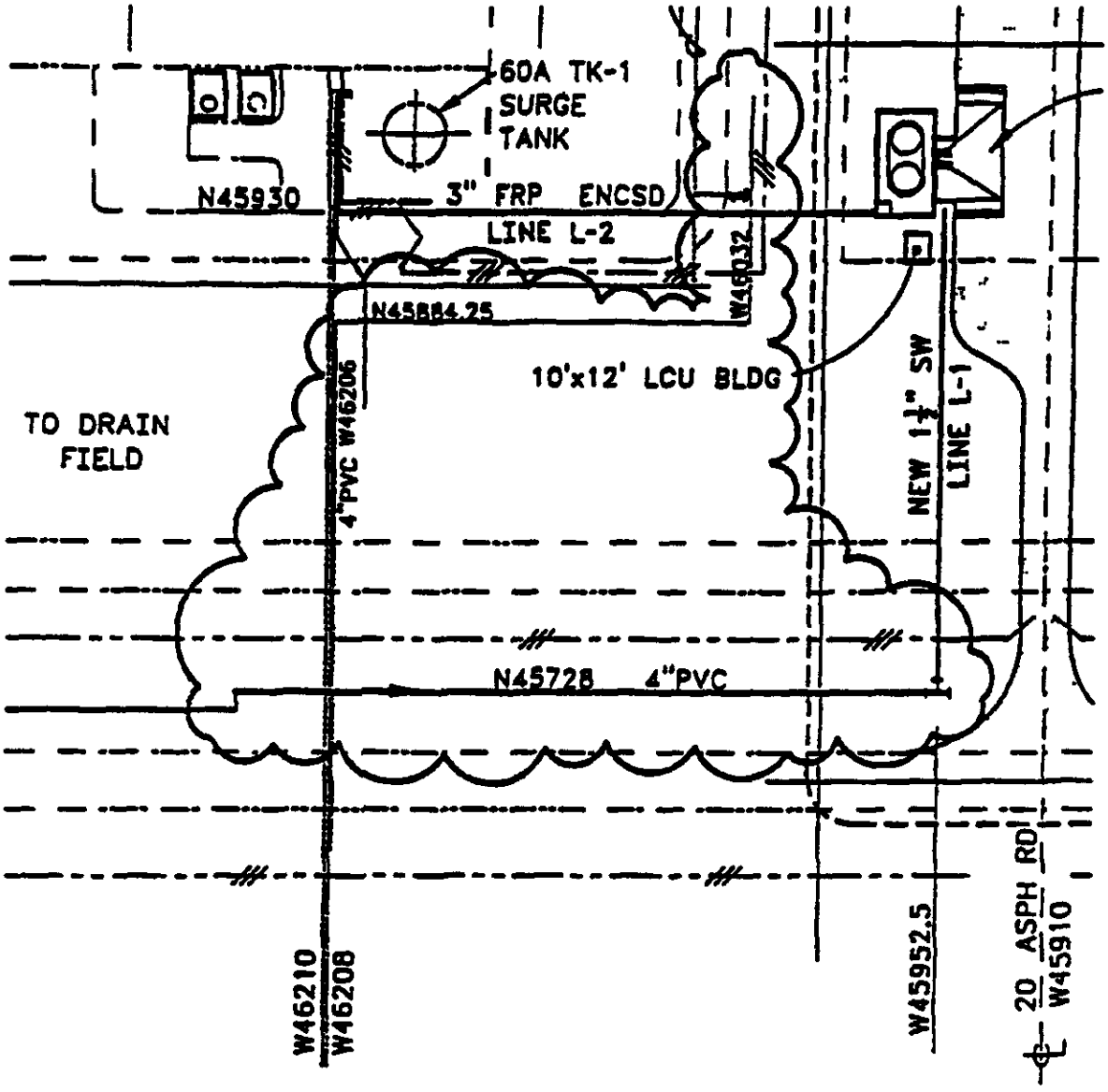
ITEM 5
a DE/O, Conduit penetration was left off of detail

ITEM 6
a DI, Pump installation note is made more clear

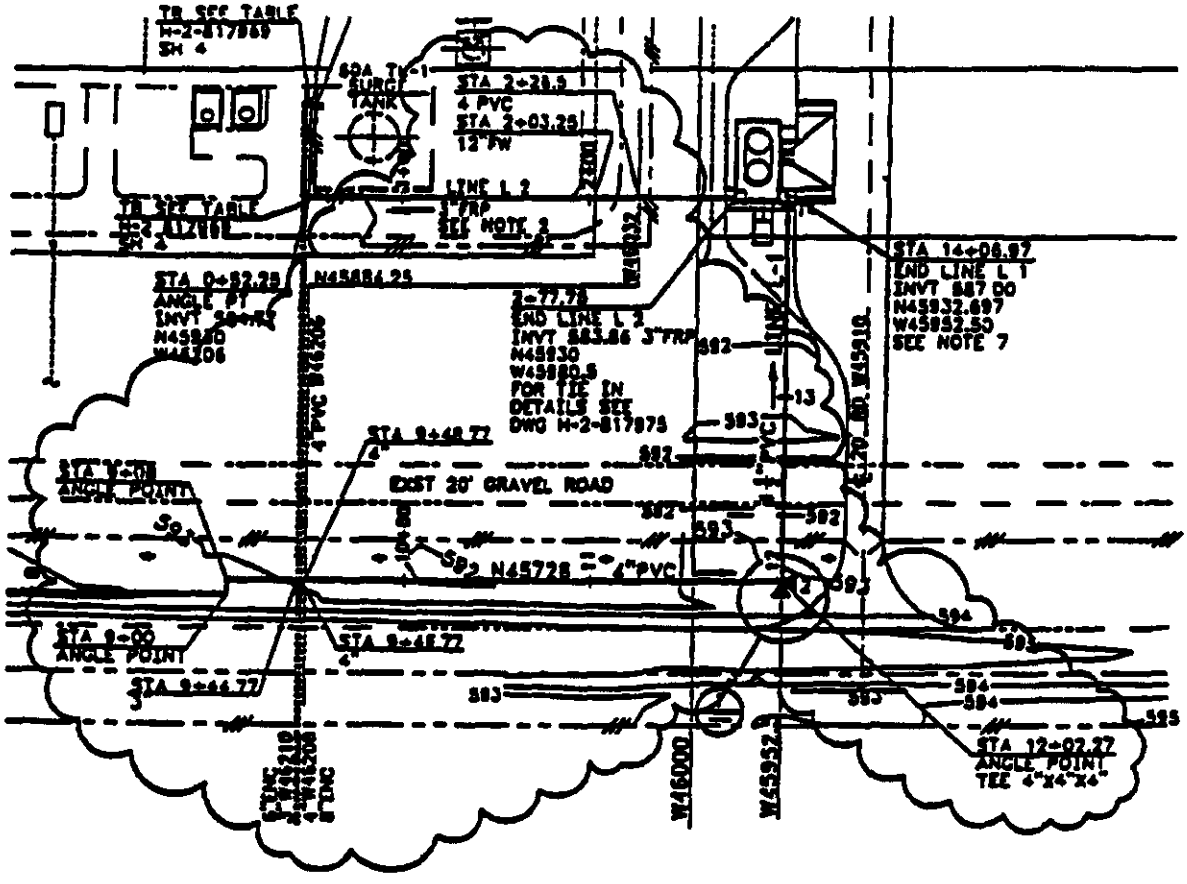
ITEM 7
a AF, Same as Item 3a and 4a

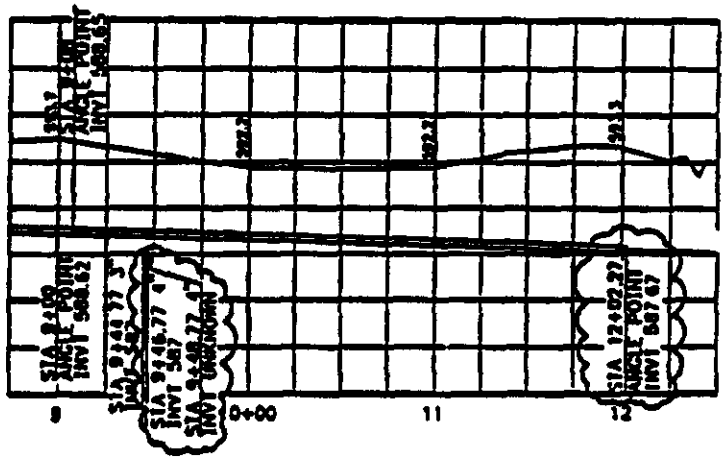
ITEM 8
a FC, Because of Item 2d, Compression Coupling is no longer needed in Pipe Code A and is needed in Pipe Code C

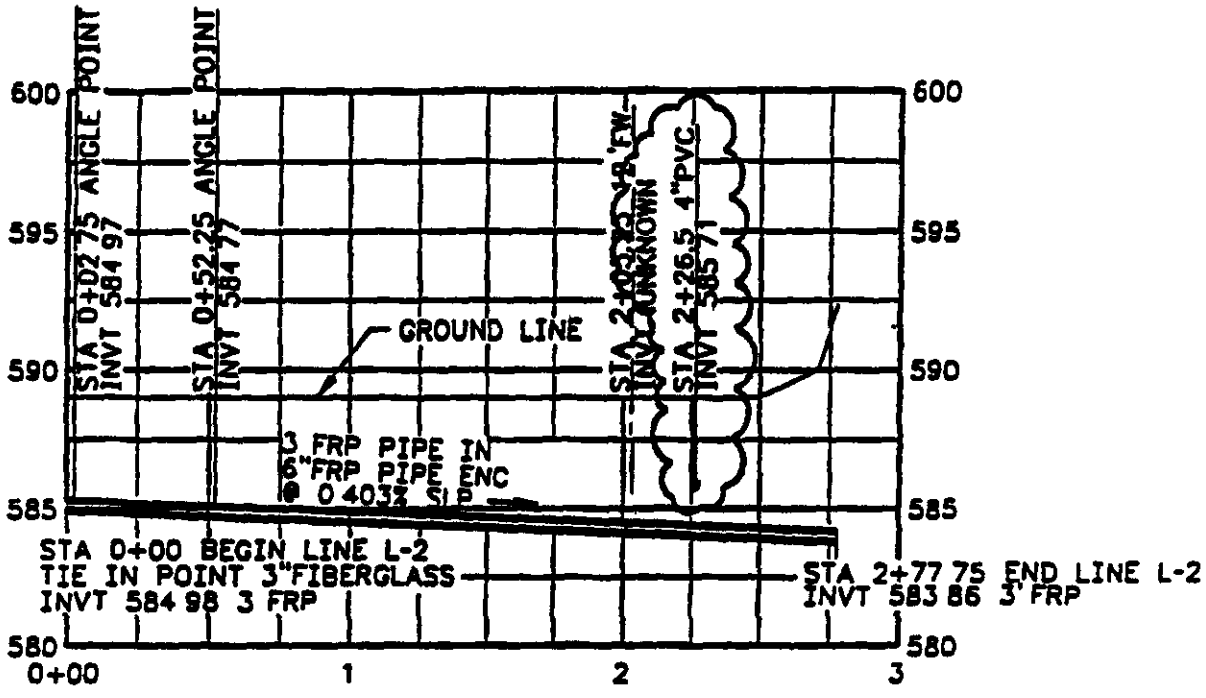
KAISER ENGINEERS HANFORD			ENGINEERING CHANGE NOTICE SKETCH			
Ref Dwg.	Sh.	Rev.	Prepared By	Checked By	ECN No.	P.
H-2-817969	1	0	RC CROSKREY		W-291H-15	



KAISER ENGINEERS HANFORD			ENGINEERING CHANGE NOTICE SKETCH			
Ref Dwg.	Sh.	Rev.	Prepared By	Checked By	ECN No.	Pag
H-2-817969	2	0	RC CROSKREY		W-291H-15	6







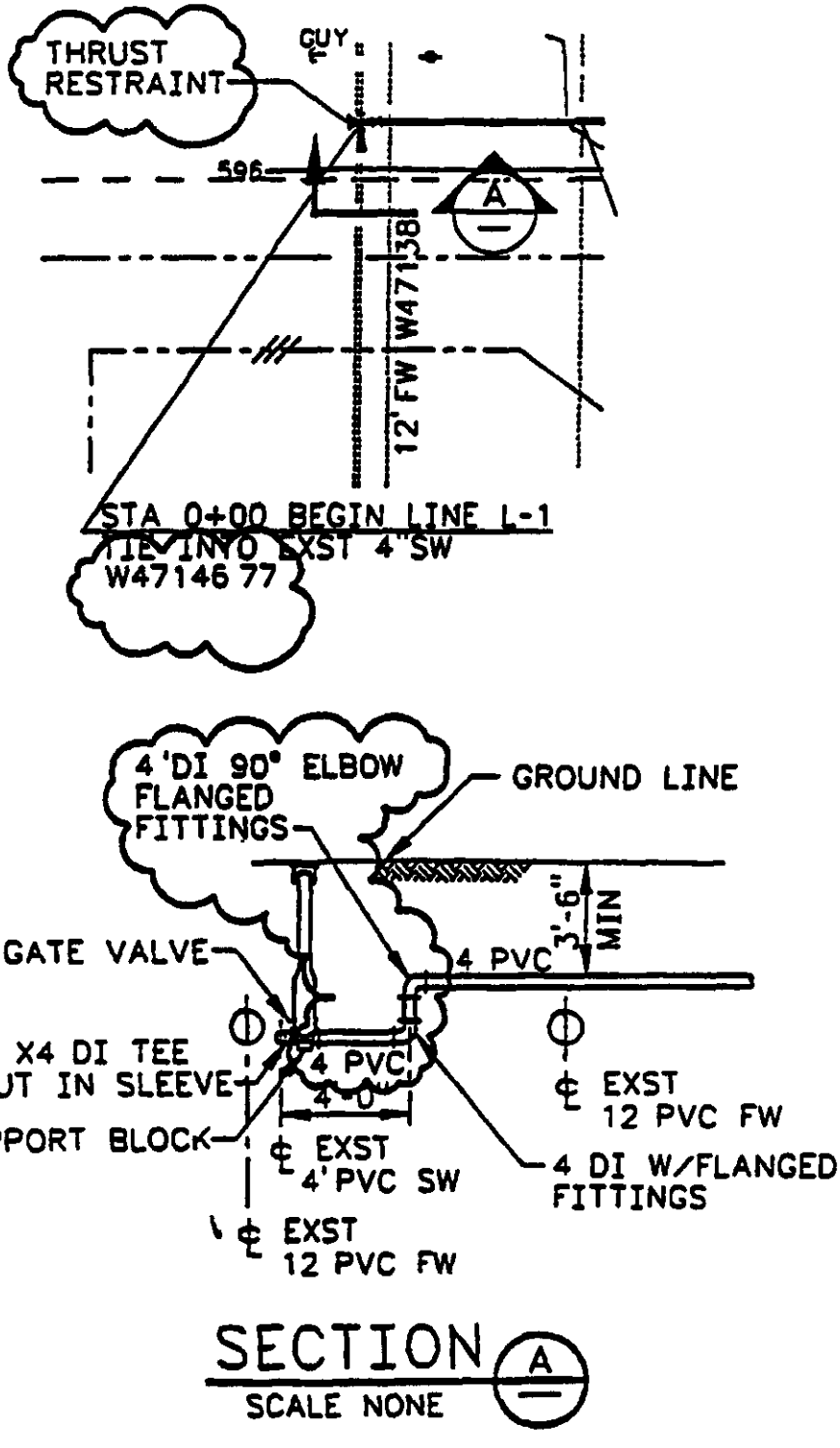
PROFILE LINE L-2

SCALE VERTICAL 1"=5
HORIZONTAL 1"=50

KAISER ENGINEERS HANFORD

ENGINEERING CHANGE NOTICE SKETCH

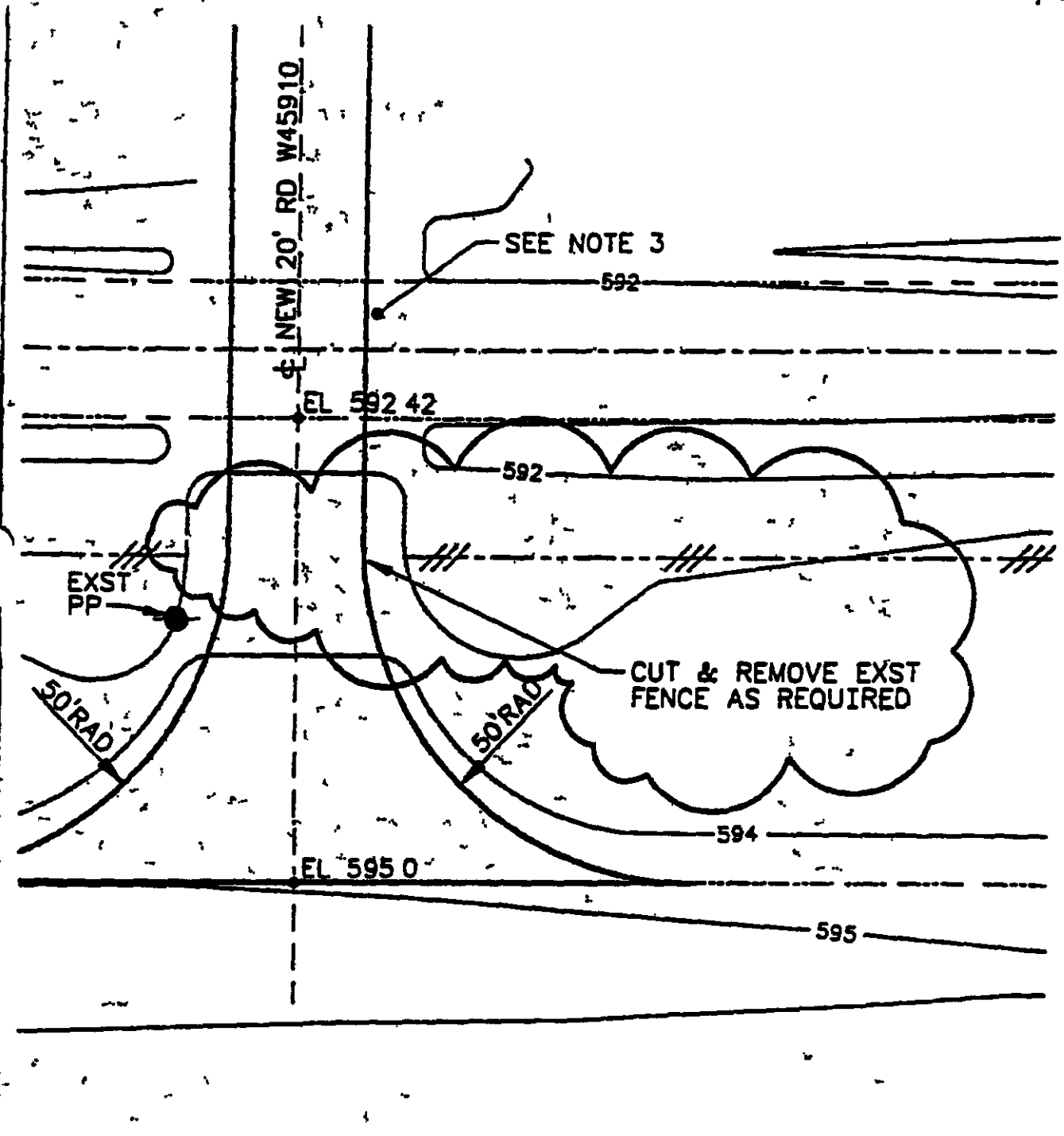
Ref Dwg.	Sht.	Rev.	Prepared By	Checked By	ECN No.	Page
H-2-817969	2	0	RC CROSKREY		W-291H-15	8



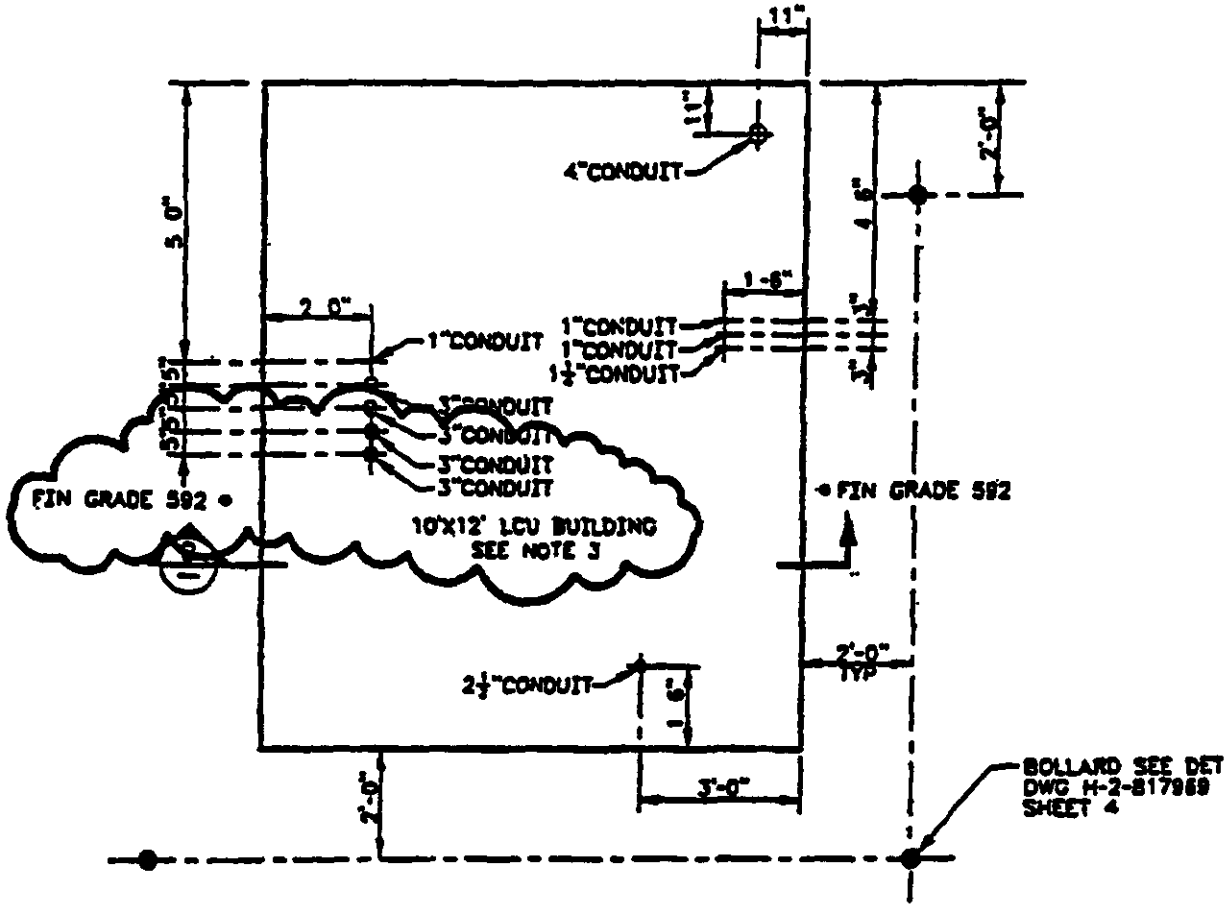
SECTION (A)

SCALE NONE

KAISER ENGINEERS HANFORD	ENGINEERING CHANGE NOTICE SKETCH					
Ref Dwg	Sh.	Rev	Prepared By	Checked By	ECN No.	Page
H-2-817969	3	0	RC CROSKREY		W-291H-15	9/10



KAISER ENGINEERS HANFORD			ENGINEERING CHANGE NOTICE SKETCH			
Ref Dwg. H-2-817969	Sh. 5	Rev 0	Prepared By RC CROSKREY	Checked By	ECN No. W-291H-15	Page 1C



DETAIL (2)
SCALE ½ =1-0 (H-2-817969 SH 3)

CPF 18

ENGINEERING CHANGE NOTICE

ESSENTIAL

Page 1 of 24

1 ECN 641703

Proj ECN

2 ECN Category (mark one)	3 Originator s Name Organization MSIN and Telephone No	4 USQ Required?	5 Date
Supplemental [X] Direct Revision [] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	RN Wagner/32200/S6 71/376 4460	[] Yes [X] No	May 13 1997
	6 Project Title/No /Work Order No Misc Mods and As Builts for ETF Load In Station	7 Bldg /Sys /Fac No 2025E/59A 60M/ 200 Area ETF	8 Approval Designator NA
	9 Document Numbers Changed by this ECN (includes sheet no and rev) See Block 13A	10 Related ECN No(s) N/A	11 Related PO No NA

12a Modification Work	12b Work Package No	12c Modification Work Complete	12d Restored to Original Condition (Temp or Standby ECN only)
[X] Yes (fill out Blk 12b) [] No (NA Blks 12b 12c 12d)	EL 96 00208 EL 97 00343	Design Authority/Cog Engineer Signature & Date	NA Design Authority/Cog Engineer Signature & Date

13a Description of Change 13b Design Baseline Document? [X] Yes [] No

This ECN implements the following changes

- Remove flow orifice in System 60M transfer line from Load In Station
- As build sample valve and tanker vent valving
- Add drain lines and valves to Load In Station pump cases
- Add bell reducer funnels and valving to suction of Load In Station pumps
- Replace Facility with Station in all Load In drawing titles
- Identify status of Load In Station drawings to Essential or Support

Piping fittings and jointing methods to meet the requirements of Hanford Site piping specification Class M 9 Install inspect and test the new piping installation in accordance with ASME B31 3 and Addenda for Category D fluid service

(Block 13a continued on Page 3)

14a Justification (mark one)

Criteria Change	[]	Design Improvement	[X]	Environmental	[]	Facility Deactivation	[]
As Found	[X]	Facilitate Const	[]	Const Error/Omission	[]	Design Error/Omission	[]

14b Justification Details

Remove flow orifice in transfer line from Load In Station to increase flow rate
As build sample valve and tanker vent valving for configuration control
Add drain lines and valves to Load In Station pump cases for improved contamination control
Add bell reducer funnels and valving to allow priming of Load In Station pumps
Replace Facility with Station in drawing titles to reflect the status of the Load In Station as part of the 200 Area ETF rather than a stand alone facility
Identify status of Load In Station drawings to Essential or Support as appropriate

15 Distribution (include name MSIN and no of copies)

N J Sullivan	S6 72	1		R J Nicklas	S6 72	1
J E Geary	S6 71	2		A K Yoakum	S6 71	1
R N Wagner	S6 71	2		S P Biglin	S6 74	1
C M Towne	S6 74	1		E A McNamar	S6 74	1
J L Vigue	S6 74	1		B S Darling	S6 72	1
J F Berger	S6 74	1		D P Nelsen	S6 71	1
T W Dallas	S6 71	1		Stations 3/4/5/15/16/30		

(* Advance Copies)

RELEASE STAMP
DATE: MAY 27 1997
STA: 30
HANFORD RELEASE
ID: 25

A 7900 013 2 (05/96) GEF095

ENGINEERING CHANGE NOTICE

1 ECN (use no from pg 1): 641703

16 Design Verification Required	17 Cost Impact				18 Schedule Impact (days)	
	ENGINEERING	NA	CONSTRUCTION		NA	
[X] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[] No	Savings	[] $	Savings	[] $	Delay	[]

19 Change Impact Review Indicate the related documents (other than the engineering documents identified on side 1) that will be affected by the change described in Block 13 Enter the affected document number in Block 20

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Desig Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spa es Multiple Unit Listing	[]
Criticality Specification	[]	Calib ation Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[X]
Equipment Spec	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const Spec	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec	[]	Operating Instruction	[]	Compute Softwa e	[]
Vendor Information	[X]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiat Work Permit	[]	Essential Material Specificatio	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	F Proc Samp S hedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Pla	[]		[]
Environmental Permit	[]	In entory Adjustment Request	[]		[]

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

Document Number/Revision	Document Number/Revision	Document Number Revision
JCS Database (Component Index)		

21 Approvals

	Signature	Date
Design Authority	R N Wagner	5/23/97
Cog Eng	R N Wagner	5/22/97
Cog Mgr	R J Nicklas for	5 23-97
QA		
Safety		
Environ		
Other		

	Signature	Date
Design Agent		
PE		
QA		
Safety		
Design		
Environ		
Other		

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

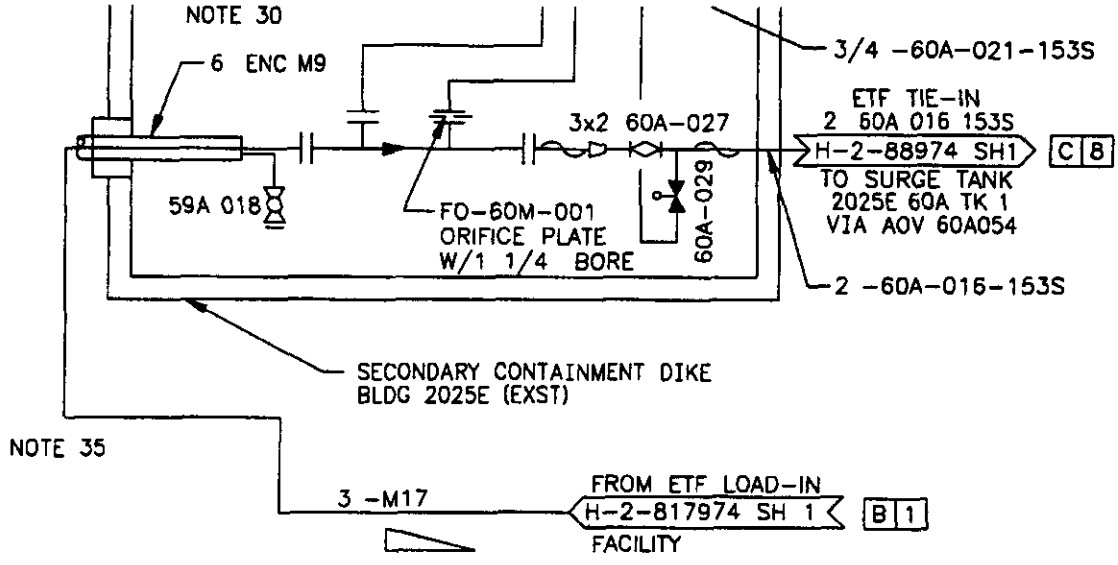
Documents changed by this ECN (also see attached drawing changes)

H 2 88766 Sheet 4 Rev 2
H 2 88779 Sheet 4 Rev 0
H 9 203 Sheet 1 Rev 0
H 9 203 Sheet 4 Rev 0
H 2 817968 Sheet 1 Rev 1*
H 2 817969 Sheet 1 Rev 1*
H 2 817969 Sheet 2 Rev 1*
H 2 817969 Sheet 3 Rev 1*
H 2 817969 Sheet 4 Rev 1*
H 2 817969 Sheet 5 Rev 1*
H 2 817970 Sheet 1 Rev 1*
H 2 817970 Sheet 2 Rev 1*
H 2 817971 Sheet 1 Rev 1*
H 2 817971 Sheet 2 Rev 1*
H 2 817972 Sheet 1 Rev 1*
H 2 817973 Sheet 1 Rev 1*
H 2 817974 Sheet 1 Rev 2*
H 2 817975 Sheet 1 Rev 1*
H 2 817976 Sheet 1 Rev 1*
H 2 817977 Sheet 1 Rev 1*
H 2 817978 Sheet 1 Rev 1*
H 2 817980 Sheet 1 Rev 1*
H 2 817981 Sheet 1 Rev 1*
H 2 817981 Sheet 2 Rev 1*
H 2 817981 Sheet 3 Rev 1*
H 2 817981 Sheet 4 Rev 1*
H 2 817981 Sheet 5 Rev 1*
H 2 817983 Sheet 1 Rev 0*
H 2 817983 Sheet 2 Rev 1*
H 2 817983 Sheet 3 Rev 0*
H 2 817983 Sheet 4 Rev 1*
H 2 817983 Sheet 5 Rev 0*
H 2 817983 Sheet 6 Rev 1*
H 2 817983 Sheet 7 Rev 0*
H 2 817983 Sheet 8 Rev 0*
H 2 817985 Sheet 1 Rev 1*
H 2 817985 Sheet 2 Rev 1*
H 2 817987 Sheet 1 Rev 1*
H 2 817987 Sheet 3 Rev 1*
H 2 817987 Sheet 4 Rev 1*
H 2 817988 Sheet 1 Rev 1*
H 2 817988 Sheet 2 Rev 1*
H 2 817988 Sheet 3 Rev 1*
H 2 817989 Sheet 1 Rev 1*
H 2 817990 Sheet 1 Rev 1*
H 2 817991 Sheet 2 Rev 1*

(* Title and/or Essential/Support status is changed for these drawings per this ECN)

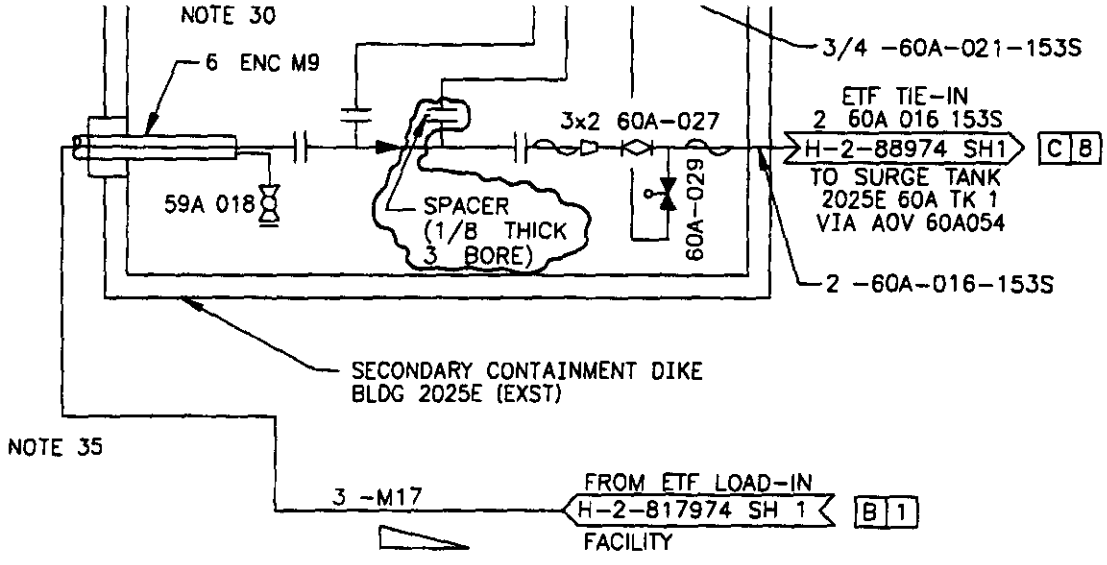
H 2 88766, Sheet 4, Rev 2, Zone D 2

IS



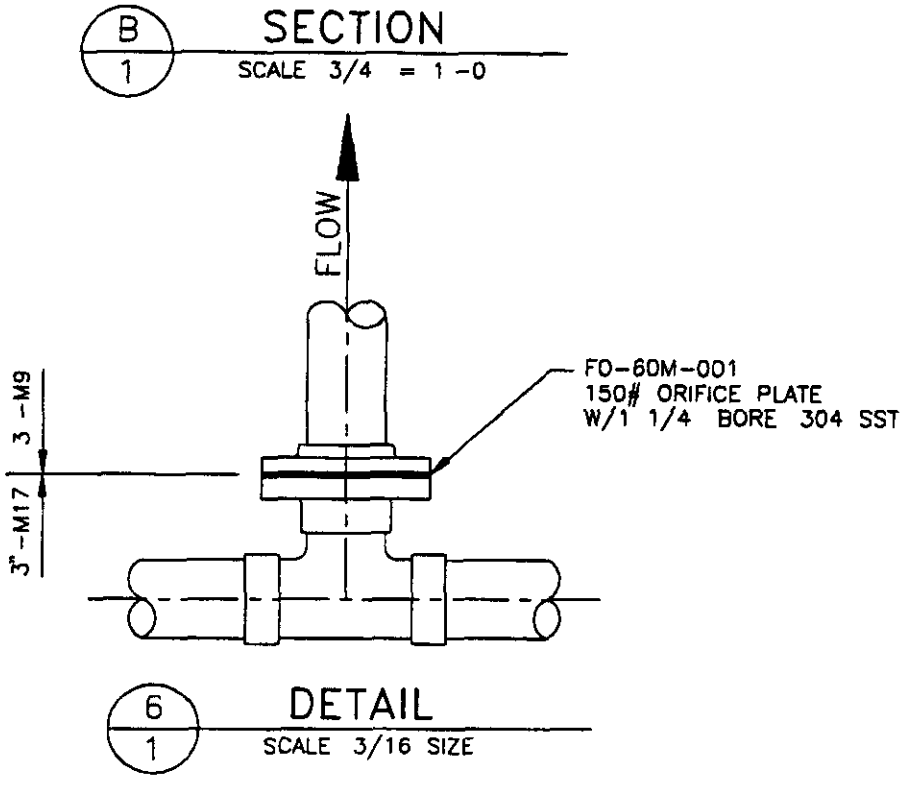
H 2 88766, Sheet 4, Rev 2, Zone D 2

CHANGE TO



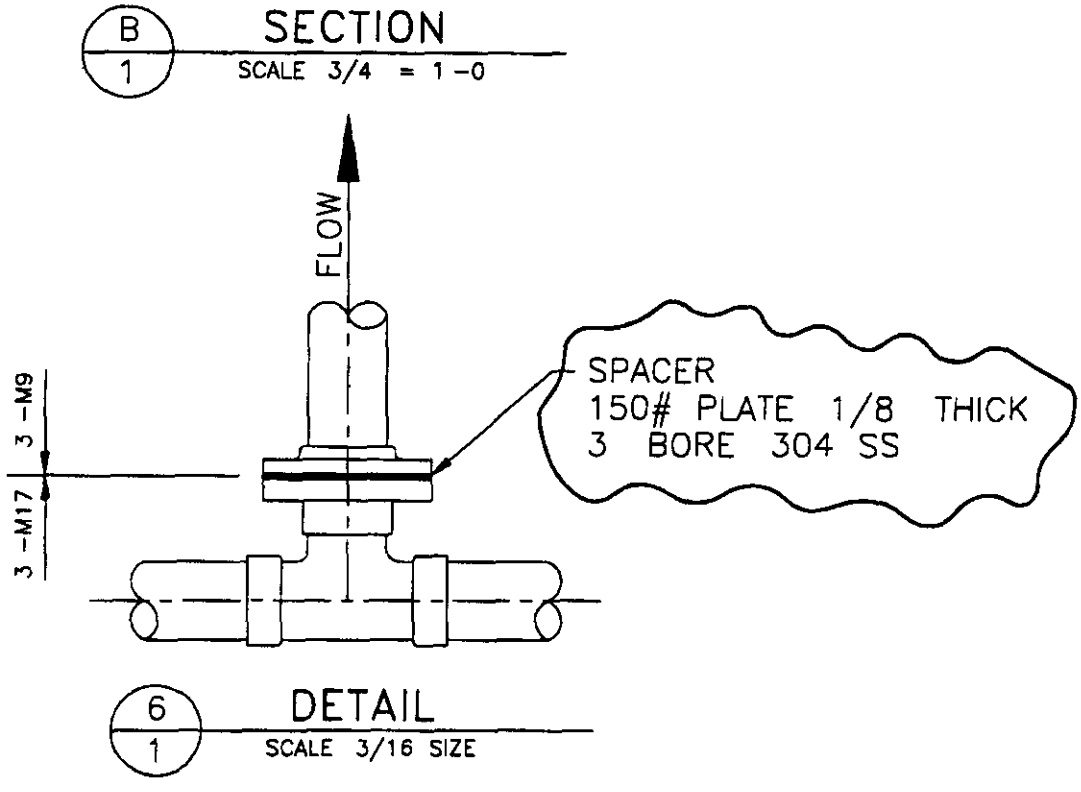
H 2 88779, Sheet 4, Rev. 0, Zone B 2

IS



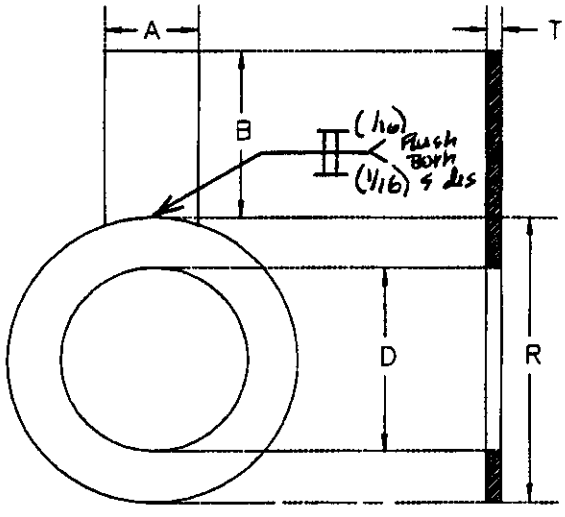
H 2 88779, Sheet 4, Rev. 0, Zone B 2

CHANGE TO



Sketch for 3 spacer shown in above changes to H 2 88779 and H 2 88766

3 FLANGE SPACER FOR ECN 641703



T = 1/8 PLATE THICKNESS

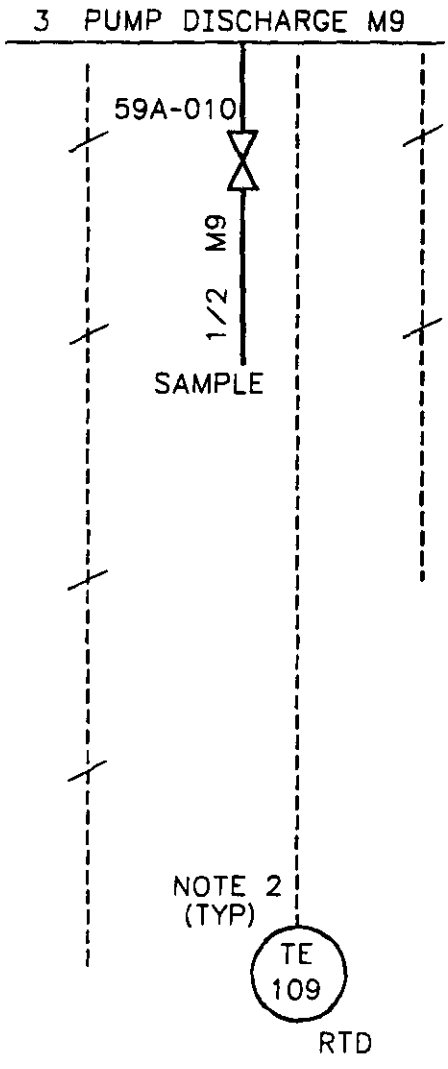
A = 2 (APPROX)
B = 3 (APPROX)

D = 3 00 +/- 05
R = 5 25 +/- 05

MATERIAL = 304SS
FLANGE CLASS = 150 LB

H 2 817974, Sheet 1, Rev. 2, Zone C 5

IS



H 2 817974, Sheet 1, Rev. 2, Zone C 5

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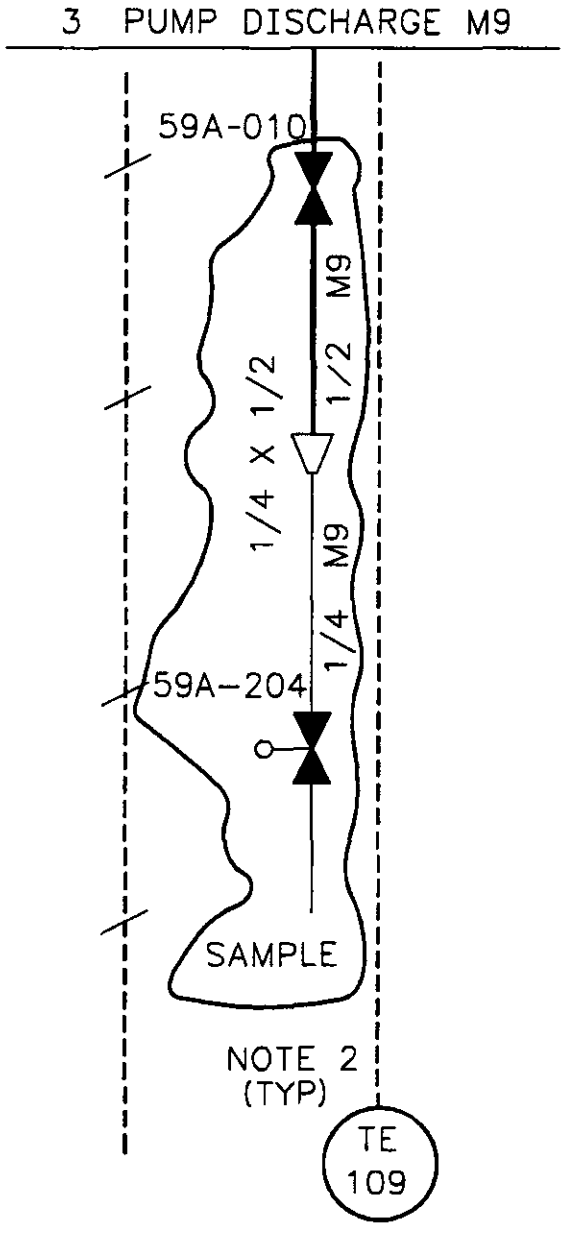
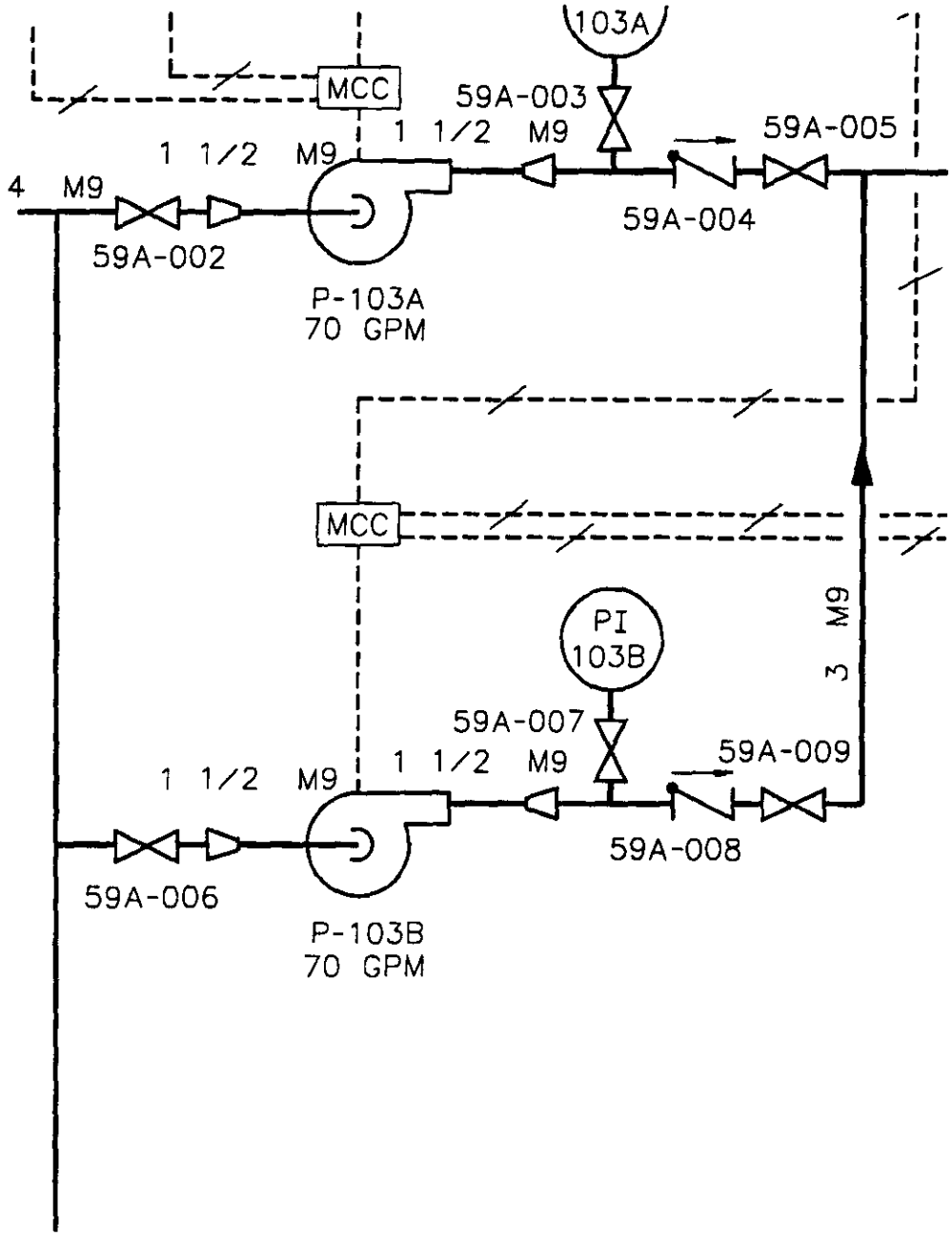


H 2 817974, Sheet 1, Rev. 2, Zone C 7 to D 7

IS



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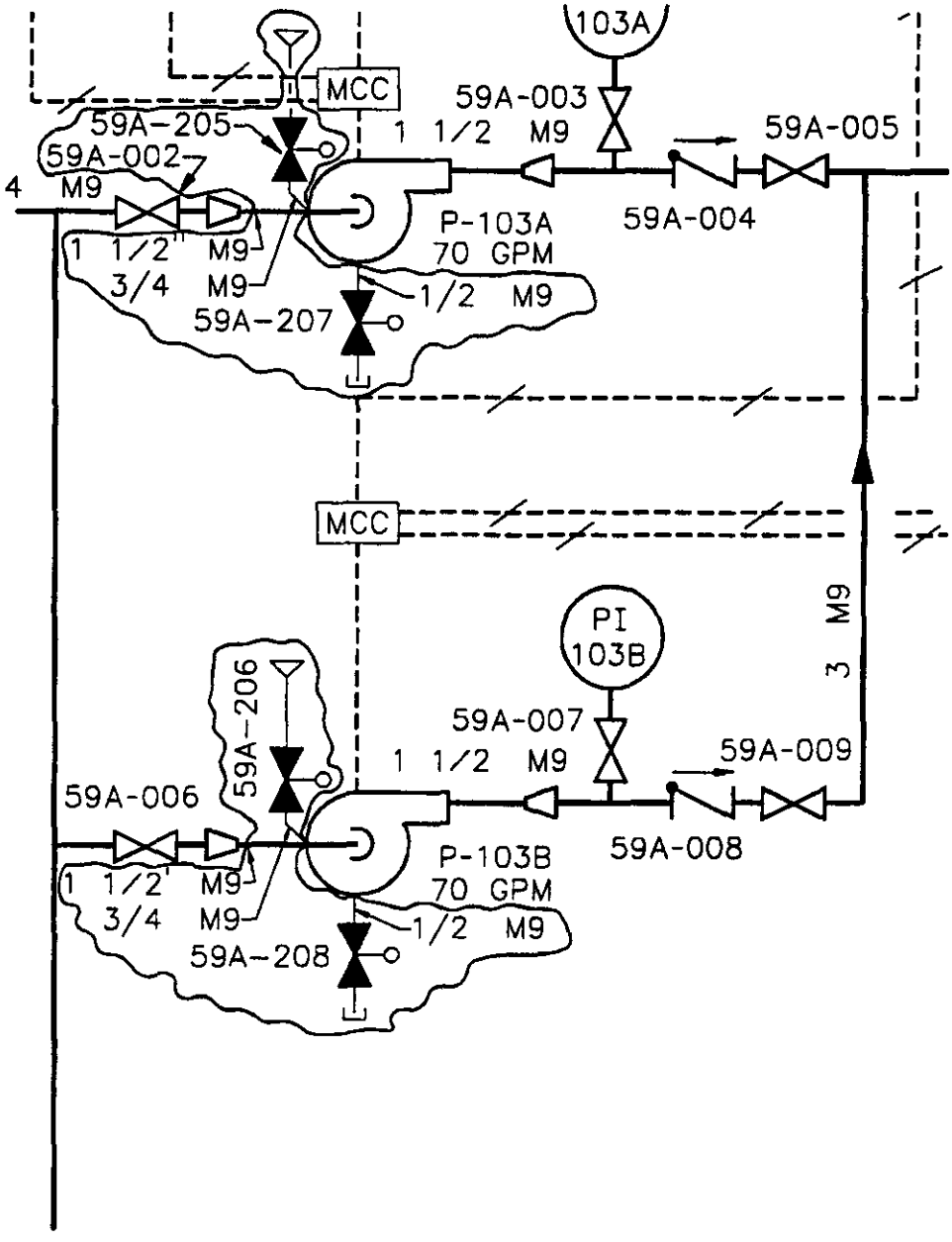

H 9 203, Sheet 1, Rev 0, Zone E 6

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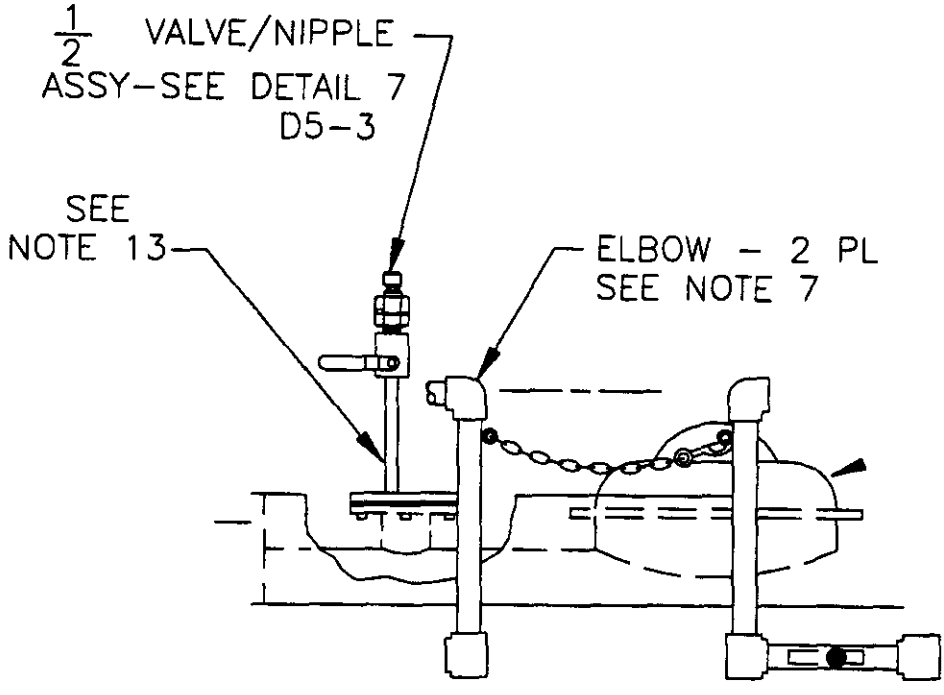

H 9 203, Sheet 1, Rev. 0, Zone E 6

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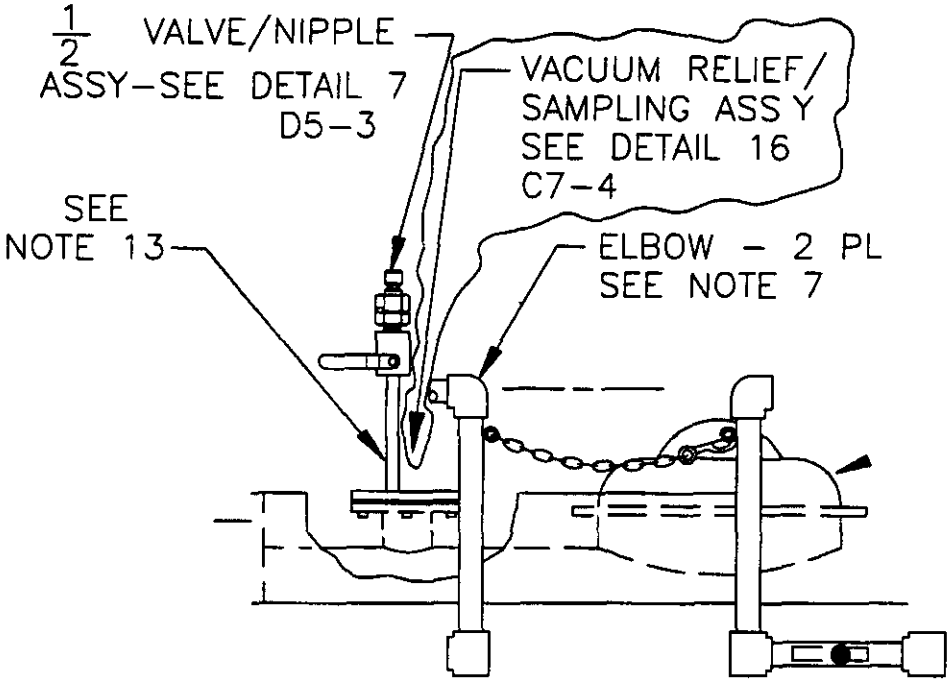

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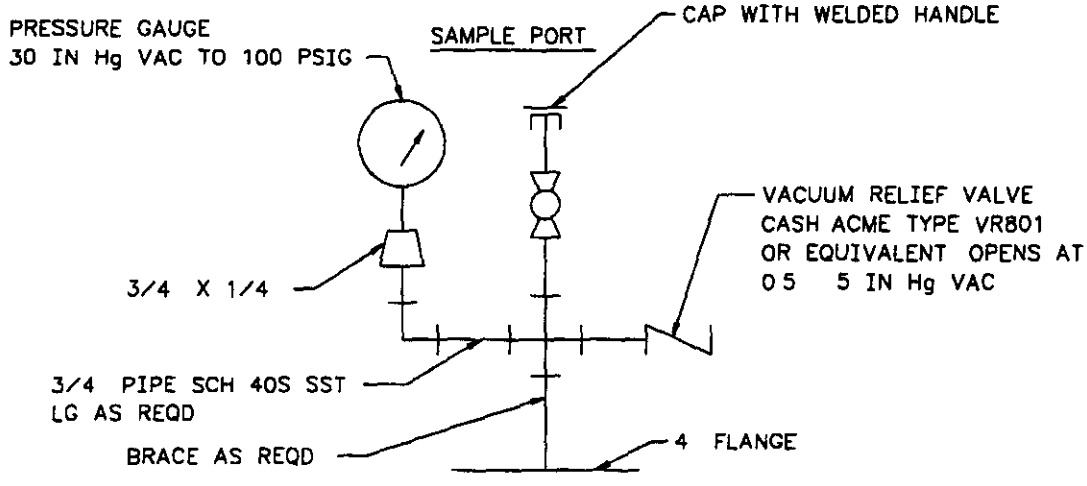
IS

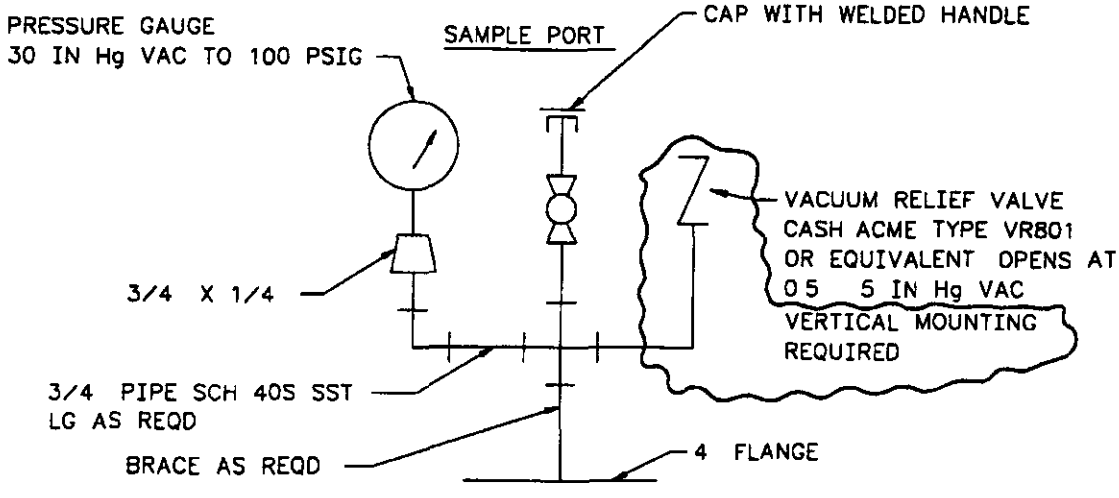


DETAIL 16 C6-2

SCALE NONE

H 9 203, Sheet 4, Rev. 0, Zone D 7

CHANGE TO



DETAIL 16 C6-2 E6 1

SCALE NONE

H 2 817968, Sheet 1, Rev. 1, Title

IS ETF TRUCK LOAD IN FACILITY LOCATION PLAN & DWG LIST

CHANGE TO ETF TRUCK LOAD IN STATION LOCATION PLAN & DWG LIST

Drawing Status ESSENTIAL

H 2 817969, Sheet 1, Rev. 1, Title

IS CIVIL ETF TRUCK LOAD IN FACILITY SITE PLAN

CHANGE TO CIVIL ETF TRUCK LOAD IN STATION SITE PLAN

Drawing Status SUPPORT

H 2 817969, Sheet 2, Rev 1, Title

IS CIVIL ETF TRUCK LOAD IN FACILITY PLAN AND PROFILES

CHANGE TO CIVIL ETF TRUCK LOAD IN STATION PLAN AND PROFILES

Drawing Status SUPPORT

H 2 817969, Sheet 3, Rev 1, Title

IS CIVIL ETF TRUCK LOAD IN FACILITY ENLARGED PLAN

CHANGE TO CIVIL ETF TRUCK LOAD IN STATION ENLARGED PLAN

Drawing Status SUPPORT

H 2 817969, Sheet 4, Rev. 1, Title

IS CIVIL ETF TRUCK LOAD IN FACILITY MISCELLANEOUS DETAILS

CHANGE TO CIVIL ETF TRUCK LOAD IN STATION MISCELLANEOUS DETAILS

Drawing Status SUPPORT

H 2 817969, Sheet 5, Rev. 1, Title

IS CIVIL ETF TRUCK LOAD IN FACILITY MISCELLANEOUS DETAILS

CHANGE TO CIVIL ETF TRUCK LOAD IN STATION MISCELLANEOUS DETAILS

Drawing Status SUPPORT

H 2 817970, Sheet 1, Rev. 1, Title

IS STRUCTURAL ETF TRUCK LOAD IN FACILITY PLAN AND SECTIONS

CHANGE TO STRUCTURAL ETF TRUCK LOAD IN STATION PLAN AND SECTIONS

Drawing Status SUPPORT

H 2 817970, Sheet 2, Rev. 1, Title

IS STRUCTURAL ETF TRUCK LOAD IN FACILITY SECTIONS AND DETAILS

CHANGE TO STRUCTURAL ETF TRUCK LOAD IN STATION SECTIONS AND DETAILS

Drawing Status SUPPORT

H 2 817971, Sheet 1, Rev 1, Title

IS STRUCTURAL ETF TRUCK LOAD IN FACILITY STEEL PLAN & SECTIONS

CHANGE TO STRUCTURAL ETF TRUCK LOAD IN STATION STEEL PLAN & SECTIONS

Drawing Status SUPPORT

H 2 817971, Sheet 2, Rev. 1, Title

IS STRUCTURAL ETF TRUCK LOAD IN FACILITY STEEL DETAILS

CHANGE TO STRUCTURAL ETF TRUCK LOAD IN STATION STEEL DETAILS

Drawing Status SUPPORT

H 2 817972, Sheet 1, Rev 1, Title

IS STRUCTURAL ETF TRUCK LOAD IN FACILITY SECTIONS AND DETAILS

CHANGE TO STRUCTURAL ETF TRUCK LOAD IN STATION SECTIONS AND DETAILS

Drawing Status SUPPORT

H 2 817973, Sheet 1, Rev. 1, Title

IS STRUCTURAL ETF TRUCK LOAD IN FACILITY MISC SECTIONS AND DETAILS

CHANGE TO STRUCTURAL ETF TRUCK LOAD IN STATION MISC SECTIONS AND DETAILS

Drawing Status SUPPORT

H 2 817974, Sheet 1, Rev. 2, Title

IS P & ID ETF TRUCK LOAD IN FACILITY

CHANGE TO P & ID ETF TRUCK LOAD IN STATION

Drawing Status ESSENTIAL

H 2 817975, Sheet 1, Rev. 1, Title

IS PIPING ETF TRUCK LOAD IN FACILITY PLAN

CHANGE TO PIPING ETF TRUCK LOAD IN STATION PLAN

Drawing Status ESSENTIAL

H 2 817976, Sheet 1, Rev. 1, Title

IS PIPING ETF TRUCK LOAD IN FACILITY SECTIONS AND DETAILS

CHANGE TO PIPING ETF TRUCK LOAD IN STATION SECTIONS AND DETAILS

Drawing Status SUPPORT

H 2 817977, Sheet 1, Rev 1, Title

IS PIPING ETF TRUCK LOAD IN FACILITY DETAILS

CHANGE TO PIPING ETF TRUCK LOAD IN STATION DETAILS

Drawing Status SUPPORT

H 2 817978, Sheet 1, Rev 1, Title

IS PIPING ETF TRUCK LOAD IN FACILITY PIPE SUPPORTS

CHANGE TO PIPING ETF TRUCK LOAD IN STATION PIPE SUPPORTS

Drawing Status SUPPORT

H 2 817980, Sheet 1, Rev 1, Title

IS INSTRUMENTATION ETF TRUCK LOAD IN FACILITY LEGEND & SYMBOLS

CHANGE TO INSTRUMENTATION ETF TRUCK LOAD IN STATION LEGEND & SYMBOLS

Drawing Status SUPPORT

H 2 817981, Sheet 1, Rev. 1, Title

IS INSTRUMENTATION ETF TRUCK LOAD IN FACILITY LOOP DIAGRAM

CHANGE TO INSTRUMENTATION ETF TRUCK LOAD IN STATION LOOP DIAGRAM

Drawing Status SUPPORT

H 2 817981, Sheet 2, Rev. 1, Title

IS INSTRUMENTATION ETF TRUCK LOAD IN FACILITY LOOP DIAGRAM

CHANGE TO INSTRUMENTATION ETF TRUCK LOAD IN STATION LOOP DIAGRAM

Drawing Status SUPPORT

H 2 817981, Sheet 3, Rev. 1, Title

IS INSTRUMENTATION ETF TRUCK LOAD IN FACILITY LOOP DIAGRAM

CHANGE TO INSTRUMENTATION ETF TRUCK LOAD IN STATION LOOP DIAGRAM

Drawing Status SUPPORT

H 2 817981, Sheet 4, Rev. 1, Title

IS INSTRUMENTATION ETF TRUCK LOAD IN FACILITY LOOP DIAGRAM

CHANGE TO INSTRUMENTATION ETF TRUCK LOAD IN STATION LOOP DIAGRAM

Drawing Status SUPPORT

H 2 817981, Sheet 5, Rev. 1, Title

IS INSTRUMENTATION ETF TRUCK LOAD IN FACILITY LOOP DIAGRAM

CHANGE TO INSTRUMENTATION ETF TRUCK LOAD IN STATION LOOP DIAGRAM

Drawing Status SUPPORT

H 2 817983, Sheet 1, Rev 0, Title

CHANGE TO Drawing Status SUPPORT

H 2 817983, Sheet 2, Rev. 1, Title

CHANGE TO Drawing Status SUPPORT

H 2 817983, Sheet 3, Rev. 0, Title

CHANGE TO Drawing Status SUPPORT

H 2 817983, Sheet 4, Rev. 1, Title

CHANGE TO Drawing Status SUPPORT

H 2 817983, Sheet 5, Rev. 0, Title

CHANGE TO Drawing Status SUPPORT

H 2 817983, Sheet 6, Rev. 1, Title

CHANGE TO Drawing Status SUPPORT

H 2 817983, Sheet 7, Rev. 0, Title

CHANGE TO Drawing Status SUPPORT

H 2 817983, Sheet 8, Rev. 0, Title

CHANGE TO Drawing Status SUPPORT

H 2 817985, Sheet 1, Rev. 1, Title

IS INSTRUMENTATION ETF TRUCK LOAD IN FACILITY SECTIONS AND DETAILS

CHANGE TO INSTRUMENTATION ETF TRUCK LOAD IN STATION SECTIONS AND DETAILS

Drawing Status SUPPORT

H 2 817985, Sheet 2, Rev. 1, Title

IS INSTRUMENTATION ETF TRUCK LOAD IN FACILITY SECTIONS AND DETAILS

CHANGE TO INSTRUMENTATION ETF TRUCK LOAD IN STATION SECTIONS AND DETAILS

Drawing Status SUPPORT

H 2 817987, Sheet 1, Rev. 1, Title

IS ELECTRICAL ETF TRUCK LOAD IN FACILITY SITE PLAN

CHANGE TO ELECTRICAL ETF TRUCK LOAD IN STATION SITE PLAN

Drawing Status SUPPORT

H 2 817987, Sheet 3, Rev. 1, Title

IS ELECTRICAL ETF TRUCK LOAD IN FACILITY SECTIONS & DETAILS

CHANGE TO ELECTRICAL ETF TRUCK LOAD IN STATION SECTIONS & DETAILS

Drawing Status SUPPORT

H 2 817987, Sheet 4, Rev. 1, Title

IS ELECTRICAL ETF TRUCK LOAD IN FACILITY SECTIONS & DETAILS

CHANGE TO ELECTRICAL ETF TRUCK LOAD IN STATION SECTIONS & DETAILS

Drawing Status SUPPORT

H 2 817988, Sheet 1, Rev. 1, Title

IS ELECTRICAL ETF TRUCK LOAD IN FACILITY PLAN ONE LINE & DETAILS

CHANGE TO ELECTRICAL ETF TRUCK LOAD IN STATION PLAN ONE LINE & DETAILS

Drawing Status ESSENTIAL

H 2 817988, Sheet 2, Rev. 1, Title

IS ELECTRICAL ETF TRUCK LOAD IN FACILITY PLAN GND & HEAT TRACING

CHANGE TO ELECTRICAL ETF TRUCK LOAD IN STATION PLAN GND & HEAT TRACING

Drawing Status ESSENTIAL

H 2 817988, Sheet 3, Rev. 1, Title

IS ELECTRICAL ETF TRUCK LOAD IN FACILITY PANEL SCHEDULE & DETAILS

CHANGE TO ELECTRICAL ETF TRUCK LOAD IN STATION PANEL SCHEDULE & DETAILS

Drawing Status ESSENTIAL

H 2 817989, Sheet 1, Rev. 1, Title

IS ELECTRICAL ETF TRUCK LOAD IN FACILITY ELEMENTARY DIAGRAM

CHANGE TO ELECTRICAL ETF TRUCK LOAD IN STATION ELEMENTARY DIAGRAM

Drawing Status ESSENTIAL

ENGINEERING CHANGE NOTICE CONTINUATION SHEET	ECN 641703
Page 24 of 24	Date 5/13/97

H 2 817990, Sheet 1, Rev. 1, Title

IS ELECTRICAL ETF TRUCK LOAD IN FACILITY WIRE & CONDUIT SCHEDULE

CHANGE TO ELECTRICAL ETF TRUCK LOAD IN STATION WIRE & CONDUIT SCHEDULE

Drawing Status ESSENTIAL

H 2 817991, Sheet 2, Rev. 1, Title

IS ELECTRICAL ETF TRUCK LOAD IN FACILITY TELECOMMUNICATIONS

CHANGE TO ELECTRICAL ETF TRUCK LOAD IN STATION TELECOMMUNICATIONS

Drawing Status SUPPORT

Hanford Facility RCRA Permit Modification Notification Forms
Part III, Chapter 5 and Attachment 35
242 A Evaporator

Index

Hanford Facility RCRA Permit Modification Notification Form

Unit	Permit Part & Chapter
242 A Evaporator	**Part III, Chapter 5 and Attachment 35**

Description of Modification

Hanford Facility RCRA Permit Condition III 5 A

III 5 A COMPLIANCE WITH APPROVED PERMIT APPLICATION

The Permittees shall comply with all requirements set forth in Attachment 35 including the Amendments specified in Condition III 5 B if any exist Enforceable portions of the application are listed below all subsections figures and tables included in these portions are also enforceable unless stated otherwise)

Part A Form 3 Permit Application Revision 7

Section 2 2	Topographic Map (non enforceable sections in Chapter 2 were modified in Class 1 Modification) from quarter ending September 30 2001
Section 3 2	Waste Analysis from Class 1 Modification for quarter ending March 31 2001
Chapter 4 0	Process Information from Class 1 Modification for quarter ending December 31 1999
Chapter 6 0	Procedures to Prevent Hazards dated May 1998 from Class 1 Modification for quarter ending March 31 2001
Chapter 7 0	Contingency Plan from Class 1 Modification for quarter ending September 30 2000
Chapter 8 0	Personnel Training from Class 1 Modification for quarter ending September 30 2001
Chapter 11 0	Closure and Financial Assurance from Class 1 Modification for quarter ending June 30 1998
Chapter 12 0	Reporting and Recordkeeping from Class 1 Modification for quarter ending March 31 2001
Chapter 13 0	Other Federal and State Laws from Class 1 Modification for quarter ending March 31 2001
Appendix 2A	Topographic Map
Appendix 3A	Waste Analysis Plan for 242 A Evaporator from Class 1 Modification from quarter ending September 30 2001
Appendix 4A	Engineering Drawings from Class 1 Modification for quarter ending March 31 2002[1]
Appendix 4B	The 242 A Evaporator/Crystallizer Tank System Integrity Assessment Report
Appendix 7A	Building Emergency Plan for 242 A Evaporator from Class 2 modification dated February 2001 Enforceable portions include Sections 1 5 3 1 4 0 7 1 7 1 1 7 1 2 7 2 7 2 1 7 2 2 7 2 3 7 2 4 7 2 5 7 2 5 1 7 3 8 2 8 3 8 4 9 0 9 1 9 2 9 3 9 4 9 5 9 6 11 0 12 0 and 13 0

Modification Class [1 2 3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes	X			

Relevant WAC 173 303 830 Appendix I Modification A 1

Enter wording of the modification from WAC 173 303 830, Appendix I citation

A General Permit Provisions

1 Administrative and informational changes

Submitted by Co Operator	Reviewed by RL Program Office	Reviewed by Ecology	Reviewed by Ecology
3/12/02	4/2/02		
J A Van Vliet Date	G H Sanders Date	F Jamison Date	L E Ruud Date

[1] Class 1 modifications requiring prior Agency approval

[2] This is only an advanced notification of an intended Class [1]1 2 or 3 modification this should be followed with a formal modification request and consequently implement the required Public Involvement processes when required

[3] If the proposed modification does not match any modification listed in WAC 173 303 830 Appendix I then the proposed modification should automatically be given a Class 3 status This status may be maintained by the Department of Ecology or down graded to [1]1 if appropriate

Hanford Facility RCRA Permit Modification Notification Form

Unit	Permit Part & Chapter
242 A Evaporator	**Part III, Chapter 5 and Attachment 35**

Description of Modification

Appendix 4A Table 4A 1

Table 4A 1 Process and Instrumentation Diagrams

System	Drawing Number	Outstanding ECNs	Drawing Title
Vapor Liquid Separator	H 2 98988 Sh 1 Rev 7	None	P & ID Evap Recirc System
Reboiler/Recirculation Line	H 2 98988 Sh 2 Rev 5	None	P & ID Evap Recirc System
Slurry System	H 2 98989 Sh 1 Rev ~~10~~11	~~ECN 662012~~ ECN 664551 ECN 664553	P & ID Slurry System
Condensate Collection Tank	H 2 98990 Sh 1 Rev 10	None	P & ID Process Condensate System
Secondary Containment Drain System	H 2 98995 Sh 1 Rev ~~11~~12	~~ECN 664301~~ None	P & ID Drain System
Secondary Containment Drain System	H 2 98995 Sh 2 Rev 5	None	P & ID Drain System
Condensers	H 2 98999 Sh 1 Rev ~~11~~12	None	P & ID Vacuum Condenser System
Pump Room Sump	H 2 99002 Sh 1 Rev ~~5~~6	ECN 647885	P & ID Jet Gang Valve System
Condensate Recycle System	H 2 99003 Sh 1 Rev 12	None	P & ID Filtered Raw Water System

Modification Class [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes	X			

Relevant WAC 173 303 830 Appendix I Modification A 1

Enter wording of the modification from WAC 173 303 830, Appendix I citation

A General Permit Provisions

1 Administrative and informational changes

Submitted by Co Operator	Reviewed by RL Program Office	Reviewed by Ecology	Reviewed by Ecology
3/22/02	4/2/02		
J A Van Vliet Date	G H Sanders Date	F Jamison Date	L E Ruud Date

[1] Class 1 modifications requiring prior Agency approval

[2] This is only an advanced notification of an intended Class [1]1 2 or 3 modification this should be followed with a formal modification request and consequently implement the required Public Involvement processes when required

[3] If the proposed modification does not match any modification listed in WAC 173 303 830 Appendix I then the proposed modification should automatically be given a Class 3 status This status may be maintained by the Department of Ecology or down graded to [1]1 if appropriate

Hanford Facility RCRA Permit Modification Notification
Part III, Chapter 5 and Attachment 35
242 A Evaporator

Replacement Section

Index

APPENDIX 4A

ENGINEERING DRAWINGS

ENGINEERING DRAWINGS

The drawings in Table 4A 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 to demonstrate the adequacy of the design of the tank systems An update to these drawings will be provided annually to the Washington State Department of Ecology

Table 4A 1 Process and Instrumentation Diagrams

System	Drawing Number	Outstanding ECNs	Drawing Title
Vapor Liquid Separator	H 2 98988 Sh 1 Rev 7	None	P & ID Evap Recirc System
Reboiler/Recirculation Line	H 2 98988 Sh 2 Rev 5	None	P & ID Evap Recirc System
Slurry System	H 2 98989 Sh 1 Rev 11	ECN 664551 ECN 664553	P & ID Slurry System
Condensate Collection Tank	H 2 98990 Sh 1 Rev 10	None	P & ID Process Condensate System
Secondary Containment Drain System	H 2 98995 Sh 1 Rev 12	None	P & ID Drain System
Secondary Containment Drain System	H 2 98995 Sh 2 Rev 5	None	P & ID Drain System
Condensers	H 2 98999 Sh 1 Rev 12	None	P & ID Vacuum Condenser System
Pump Room Sump	H 2 99002 Sh 1 Rev 6	ECN 647885	P & ID Jet Gang Valve System
Condensate Recycle System	H 2 99003 Sh 1 Rev 12	None	P & ID Filtered Raw Water System

ECN engineering change notice
P & ID piping and instrumentation diagram

The drawings in Table 4A 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 ECNs that affect the secondary containment systems will be submitted to the Washington State Department of Ecology as a Class 1 2 or 3 permit modification as required by WAC 173 303 830

Table 4A 2 Drawing of 242 A Evaporator Secondary Containment Systems

System	Drawing Number	Outstanding ECNs	Drawing Title
242 A Building	H 2 69277 Sh 1 Rev 2	None	Structural Foundation Plan Sections & General Notes Areas 1 & 2
	H 2 69278 Sh 1 Rev 3	None	Structural Foundation Elevations & Details Areas 1 & 2
	H 2 69279 Sh 1 Rev 3	None	Structural First Floor Plan & AMU Areas 1 & 2
Pump Room Sump Drainage	H 2 69352 Sh 1 Rev 4	ECN 121216 ECN 121238 ECN 194242 ECN 610629 ECN 620353	Sections Process Waste Drainage
242 A Building Drainage	H 2 69354 Sh 1 Rev 4	ECN 194242 ECN 610629 ECN 620353	Plan Process Waste Drainage
Pump Room Sump	H 2 69369 Sh 1 Rev 1	None	Pump Room Sump Assembly & Details

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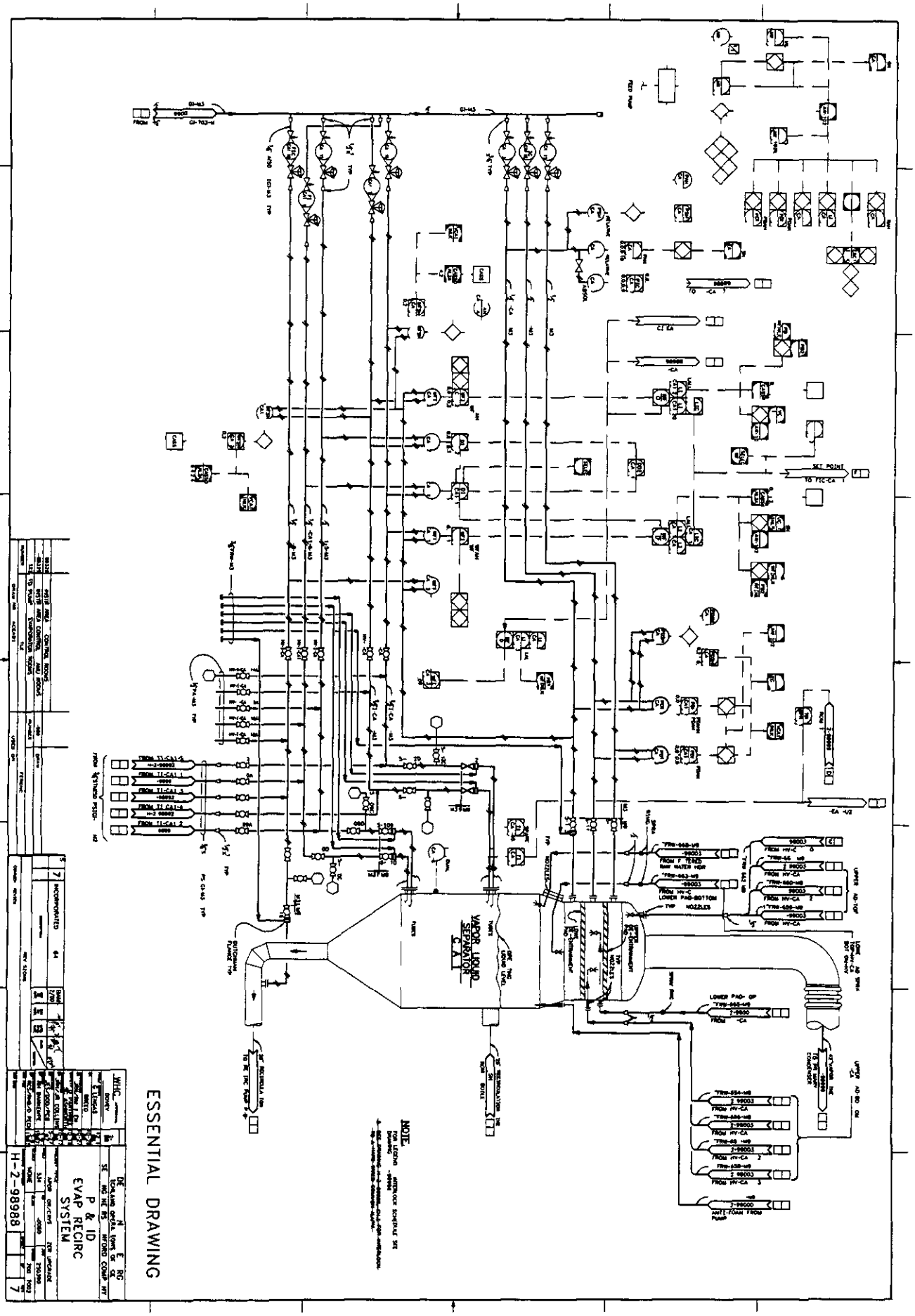
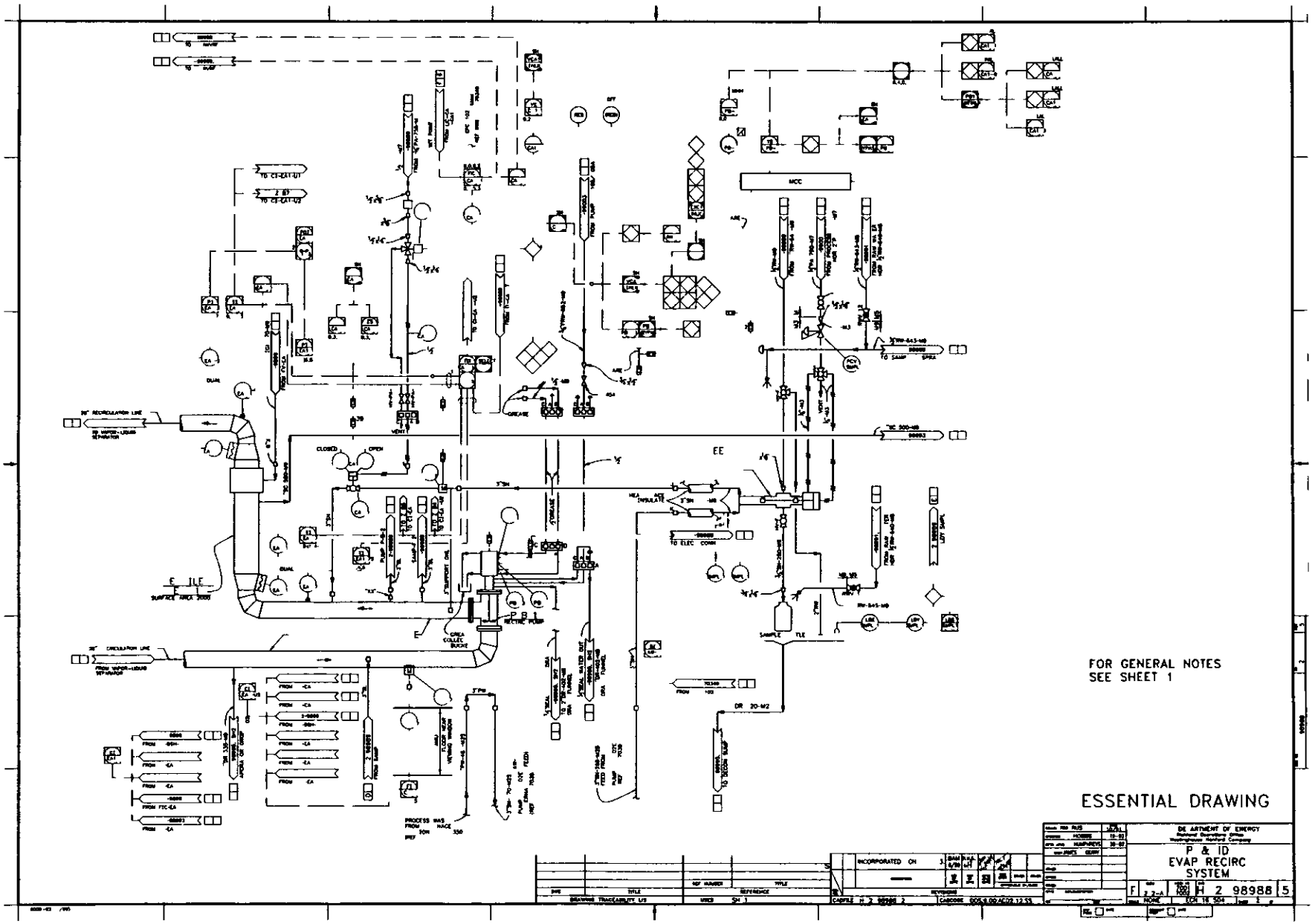
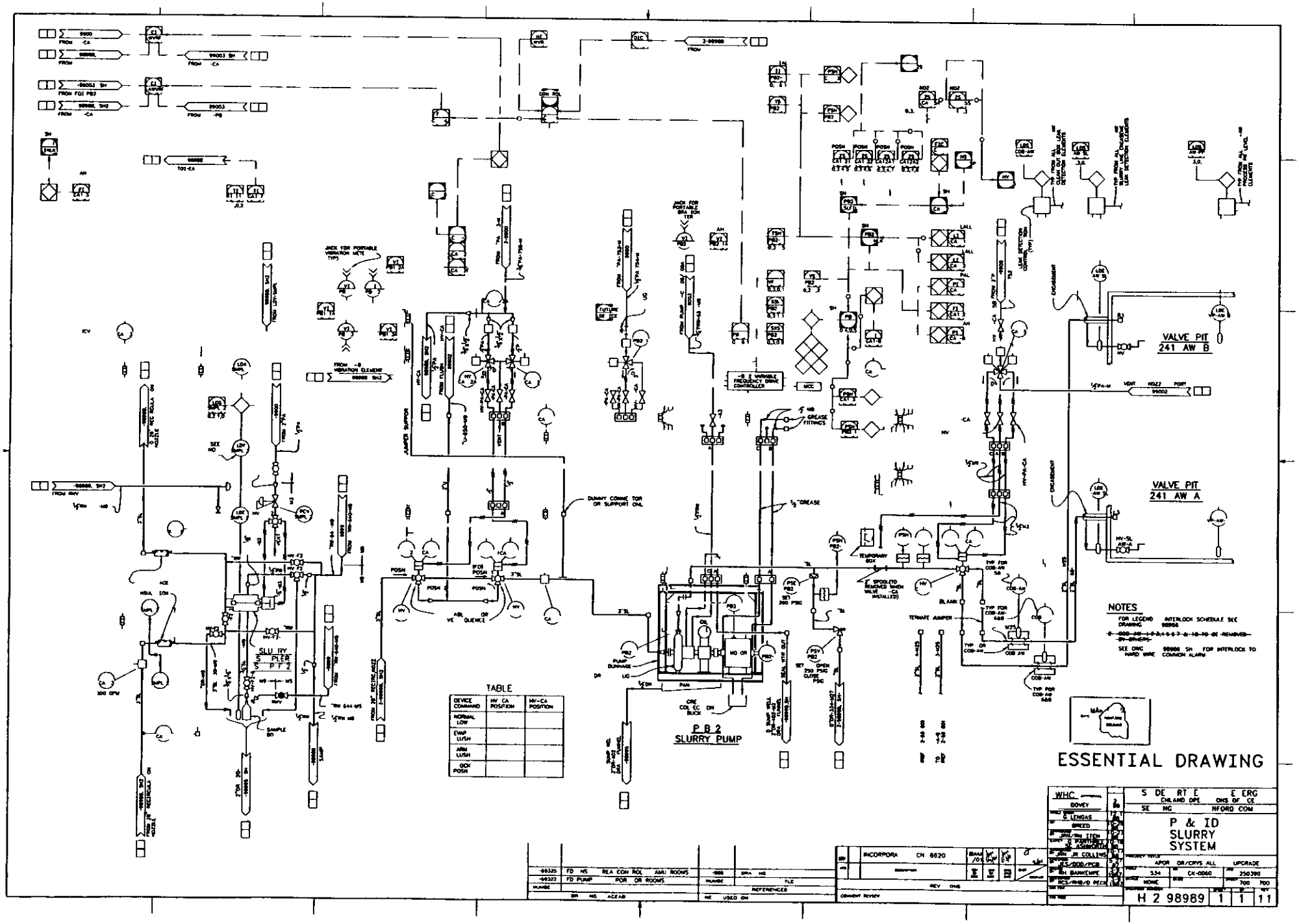

ESSENTIAL DRAWING
P & ID
EVAP RECIRC
SYSTEM
H-2-98988
VAPOR LIQUID SEPARATOR C-A1
NOTE


FOR GENERAL NOTES
SEE SHEET 1
ESSENTIAL DRAWING
P & ID
EVAP RECIRC
SYSTEM
H 2 98988 5


VALVE PIT
241 AW B
VALVE PIT
241 AW A
P B 2
SLURRY PUMP
TABLE
NOTES
ESSENTIAL DRAWING
P & ID
SLURRY
SYSTEM
H 2 98989

S

ENGINEERING CHANGE NOTICE

ESSENTIAL

Page 1 of 17

1 ECN 664551

Proj ECN

CPF 13A + B

2 ECN Category (mark one)	3 Originator's Name Organization MSIN and Telephone No	4 USQ Required?	5 Date
Supplemental ☒	Danny P Mendoza ARES Corporation 946-8946	☒ Yes ☐ No	08/10/01
Direct Revision ☐			
Change ECN ☐			
Temporary ☐			
Standby ☐			
Supersedure ☐			
Cancel/Void ☐			

6 Project Title/No /Work Order No	7 Bldg /Sys /Fac No	8 Approval Designator
242-A Evaporator Life Extension Upgrades	242-A/A11	T Q
9 Document Numbers Changed by this ECN (includes sheet no and rev)	**10 Related ECN No(s)**	**11 Related PO No**
See Block 13a	664552	N/A

12a Modification Work	12b Work Package No	12c Modification Work Completed	12d Restored to Original Condition (Temp or Standby ECNs only)
☒ Yes (fill out Blk 12b) ☐ No (NA Blks 12b 12c 12d)	EL-01-00452	Design Authority/Cog Engineer Signature & Date	N/A Design Authority/Cog Engineer Signature & Date

13a Description of Change

13b Design Baseline Document? ☒ Yes ☐ No

USQ # LW-01-032

See page 3 of this ECN for a listing of the affected drawings and a description of the change

ECN 664552 will update WHC-SD-534-SWD-001 to show the new multiplexer addresses assigned for multivariable meter input (flow density and transmitter fault)

Page 15 of this ECN has been included for information only It is not intended that this information be included on any drawing It is an Instrument Datasheet which details the design parameters that the multivariable instrument to be installed at the 242-A Evaporator for density and volumetric flow readings meet or exceed It is included in order to document the design information associated with the selection of the multivariable instrument

14a Justification (mark one)	14b Justification Details
Criteria Change ☐	The existing magnetic flow element FE CA1-3 and flow transmitter FT-CA1-3 are being replaced with a more accurate multivariable sensor and transmitter This change is required in order to support the 242-A Evaporator Life Extension activities
Design Improvement ☒	
Environmental ☐	
Facility Deactivation ☐	
As Found ☐	
Facilitate Const ☐	
Const Error/Omission ☐	
Design Error/Omission ☐	

15 Distribution (include name MSIN and no of copies)

- Indicates Advance Copy

CD Skogley	S6-71	(1)	CM Towne	S6-74	(1)
EA McNamar	S6-72	(1)	WCC Planning	S6-71	(1)
DL Flyckt	S6-71	(1)	JL Foster	S6-71	(1)
NJ Sullivan	S6-72	(1)	JA Locklair	T3-06	( )
MC Teats	S6-72	(1)	JB Benton	S6-72	(1)
RW Szelmeczka	S6-72	(1)			
JM Isdell	B4-39	(1)*			
MW Bowman	S6-72	(1)			

RELEASE STAMP

SEP 05 2001

DATE

STA. 30

HANFORD RELEASE ID 25

A 7900 013-2 (10/97)

A 7900-013-1

ENGINEERING CHANGE NOTICE

1 ECN (use no from pg 1) 664551

16 Design Verification Required	17 Cost Impact ENGINEERING	CONSTRUCTION	18 Schedule Impact (days)
☒ Yes	Additional ☐ $ N/A	Additional ☐ $ N/A	Improvement ☐ N/A
☐ No	Savings ☐ $ N/A	Savings ☐ $ N/A	Delay ☐ N/A

19 Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

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

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

Document Number/Revision	Document Number/Revision	Document Number/Revision
	ARP-T-601-012	TO-600-010
	TO-600-030	
	TO-600-035	
	TO-650-140	

21 Approvals

	Signature	Date		Signature	Date
Design Authority	EA McNamar EA McNamara	8-23-01	Design Agent		
Cog Eng	EA McNamar EA McNamara	8-23-01	PE		
Cog Mgr	KJ Lueck KJ Lueck	8 29 01	QA		
QA	MJ W rn MJ Wynn	8/29/01	Safety		
Safety			Design		
Environ			Environ		
Other			Other		
Techn c l Review	Mac Teat Mac Teat	8/29/01			
242 A Electrical DA Ma	Towne C Towne	8/29/01	DEPARTMENT OF ENERGY		
			Signature or a Control Number that tracks the Approval Signature		
			ADDITIONAL		

Affected Drawings

H-2-99048 Sh 2 Rev 3 Show location of new transmitter UIT-CA1-3 along with parts callout on AMU plan drawing as shown on page 4 of this ECN

H-2-99048 Sh 9 Rev ? Show UIT-CA1-3 parts callout/mounting details on section drawing FT-CA1-3 to be removed as shown on page 5 of this ECN

H-2-99059 Sh 2 Rev 5 Add interconnection diagram for UE/UIT-CA1-3 Delete interconnection diagram for FE/FT-CA1-3 as shown on page 6 of this ECN

H-2-99071 Sh 2 Rev 4 Show new power conduit P1312 from new JB 1230 to UIT-CA1-3 as shown on page 7 of this ECN Show reroute of power to FT-CA1-7 via P1313

H-2-99074 Sh 1 Rev 4 Show UE-CA1-3 location on plan and reference section for mounting details of junction box B-UE-CA1-3 Route new conduit P2007 to JB-UE-CA1-3 for sensor cable connection as shown on page 8 of this ECN

H-2-99048 Sh 1 Rev 4 Add new mass flowmeter transmitter Coriolis sensor and junction box JB-UE-CA1-3 to parts list as shown on page 9 of this ECN

H-2-99087 Sh 7 Rev 5 Add new wire run and conduit for UIT-CA1-3 power supply and modify existing power supply wire run to FT-CA1-7 as shown on page 9 of this ECN

H-2-98986 Sh 3 Rev 2 Update MCS Identification Letter Table to include U for multivariable instrument as shown on page 9 of this ECN

H-2-99087 Sh 8 Rev 4 Add wire run details for new wire run 441 UIT-CA1-3 power supply as shown on page 10 of this ECN

H-2-99087 Sh 10 Rev 4 Assign new conduit and wire run numbers for UE-CA1-3 to UIT-CA1-3 sensor wire and UIT-CA1-3 to MUX cabinet signal cable as shown on page 10 of this ECN

H-2-99087 Sh 2 Rev 0 Update wire run 2162 and 2185 to show cables for old flowmeter as being spare as shown on page 11 of this ECN

H-2-85324 Sh 3 Rev Update panel schedule loading values due to addition of UIT-CA1-3 as shown on page of this ECN

H-2-90977 Sh 1 Rev 1 Jumper has been redesigned with a new mass flow and density sensor Replace existing design shown on this drawing (including material list and notes) with new design shown on page 13 of this ECN

H-2-99009 Sh Rev Correct jumper location drawing to reflect new jumper and multivariable meter design as shown on page 14 of this ECN

H-2-98989 Sh 1 Rev 1 Update P&ID to show FE/FT-CA1-3 changed to UE and UIT-CA1-3 along with new MCS tags as shown on page 16 of this ECN

H-2-99949 Sh 12 Rev 1 Update MCS logic diagram to reflect new PCM Multiplexer Board and Point addresses for FI-CA1-3 as shown on page 17 of this ECN

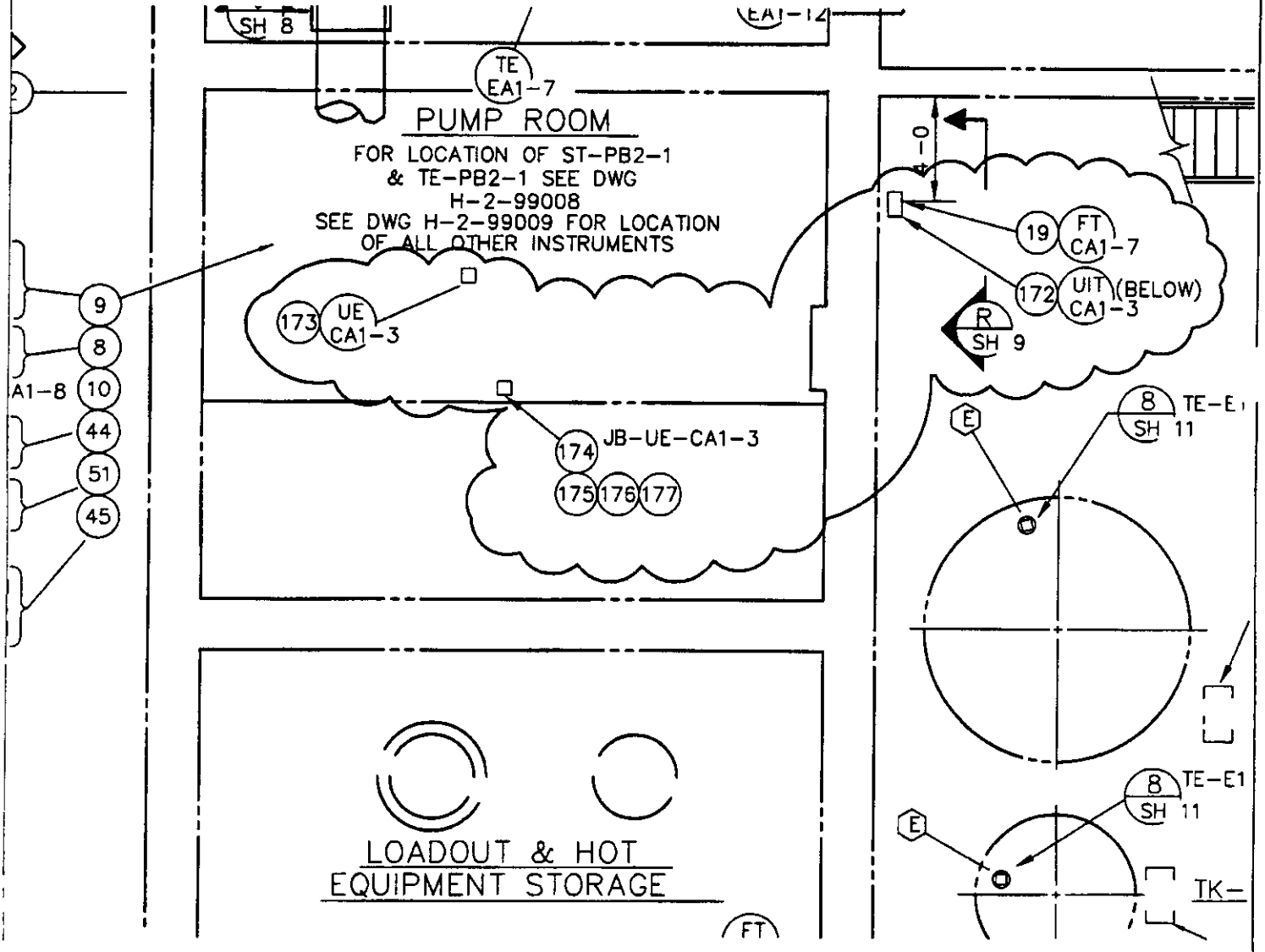
ARES CORPORATION — Applied Research & Engineering Sciences

ENGINEERING CHANGE NOTICE SKETCH

R f Dwg	Sh	Rev	Prep red By	Checked By	ECN No	P g
H-2-99048	2	3	K HALE		664551	4

ZN C-D/6-7

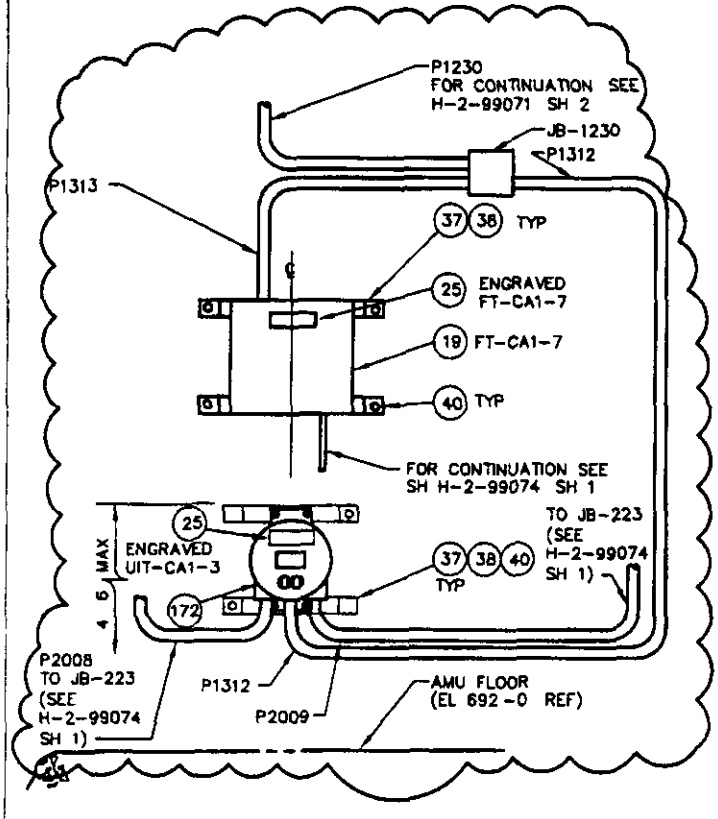
ADD NEW FLOW TRANSMITTER
(LOCATE BELOW EXST FLOW TRANSMITTER)



ARES CORPORATION	ENGINEERING CHANGE NOTICE SKETCH					
Ref Dwg	Sh	Rev	Prepared By	Check d By	ECN N	Pag
H-2-99048	9	2	K HALE		664551	5

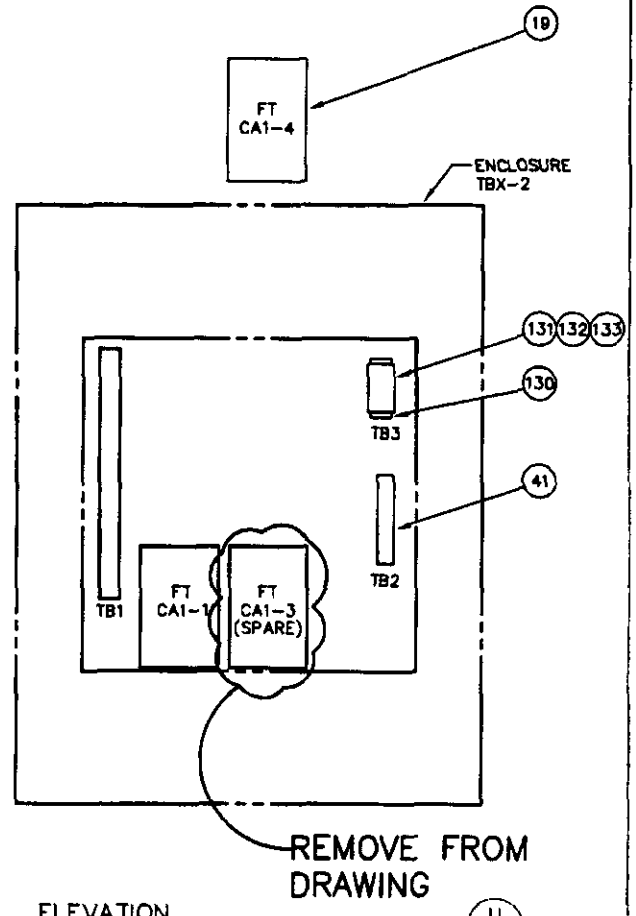
ZN D-E/3-4

ADD NEW FLOW TRANSMITTER AND NAMETAG (LOCATE NEW TRANSMITTER BELOW EXST FLOW TRANSMITTER) INTERCEPT EXST P1230 AS SHOWN
EXST FT-CA1-3 IS TO BE REMOVED CONDUCTORS TO BE SPARE



ELEVATION
FLOW TRANSMITTER INSTALLATION
AMU ROOM
SCALE 1-1/2 = 1-0

R SH 2



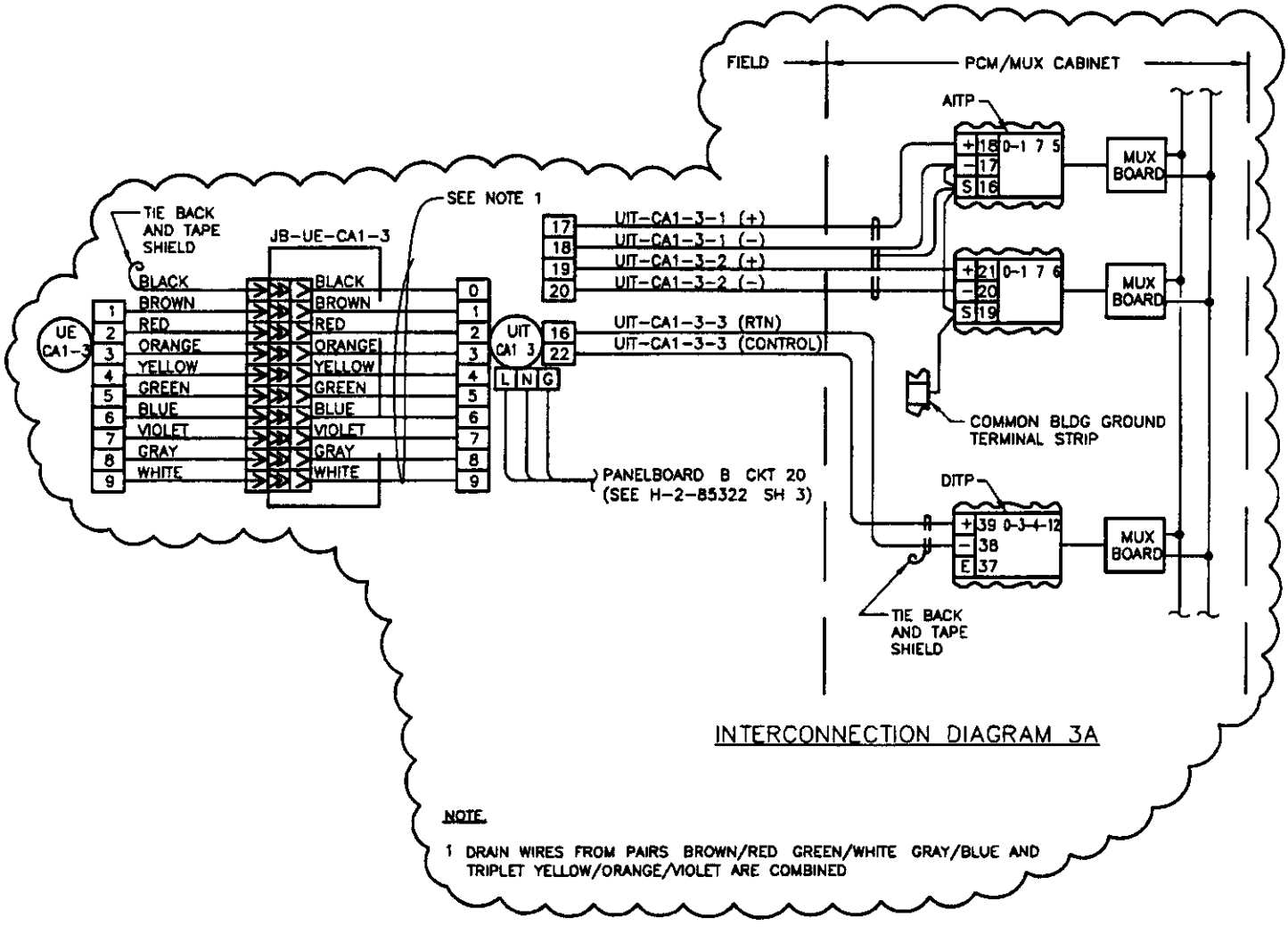
ELEVATION
SHOWN WITH TBX-2 ENCLOSURE
DOORS REMOVED
SCALE 1-1/2 = 1-0

U SH 3

ARES CORPORATION	ENGINEERING CHANGE NOTICE SKETCH					
Ref Dwg	Sh	Rev	Prep red By	Checked By	ECN N	P ge
H-2-99059	2	5	K HALE		664551	6

ZN C/5-8

REPLACE DIAGRAM 3A AS SHOWN



INTERCONNECTION DIAGRAM 3A

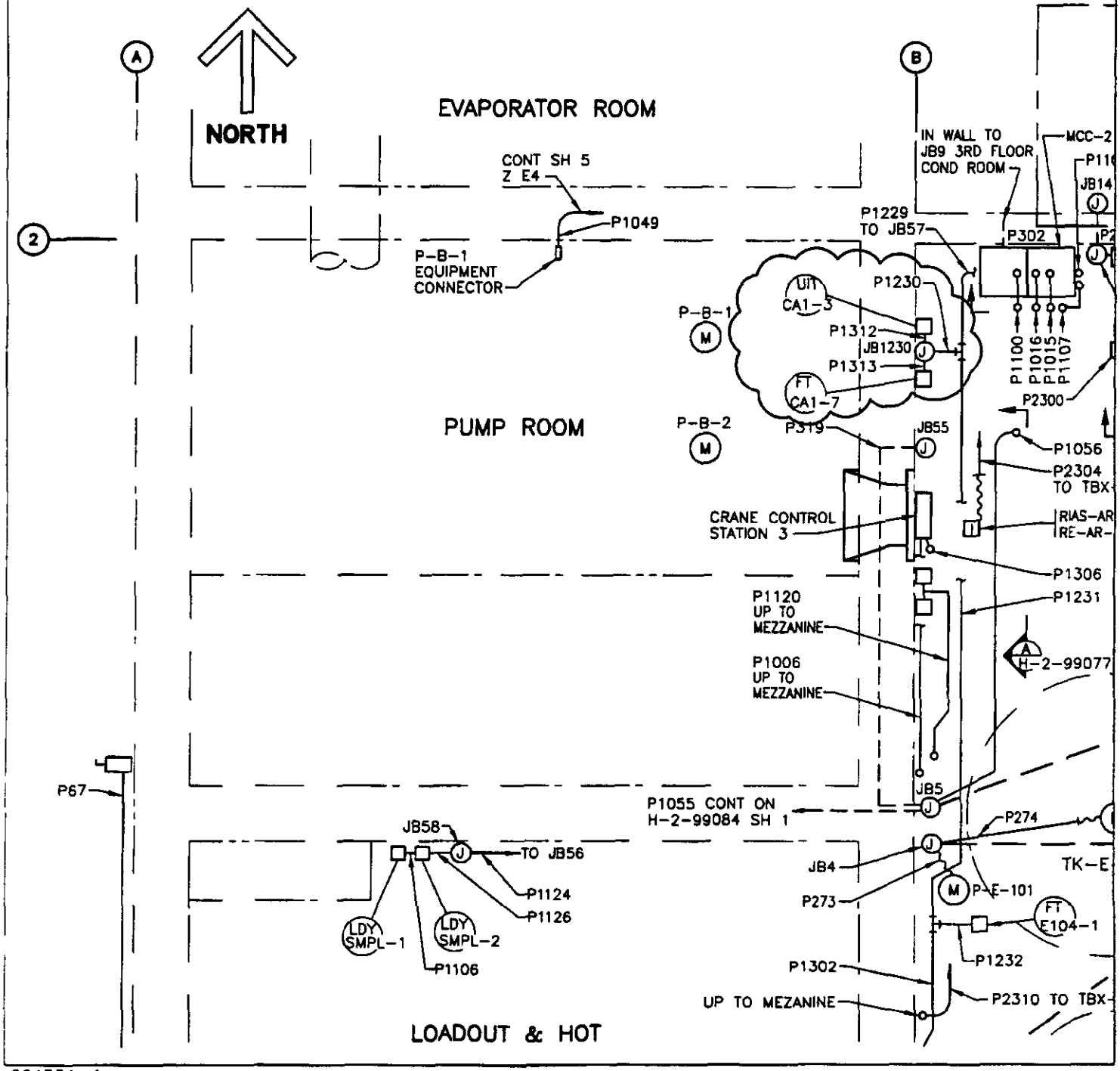
NOTE.

1 DRAIN WIRES FROM PAIRS BROWN/RED GREEN/WHITE GRAY/BLUE AND TRIPLET YELLOW/ORANGE/VIOLET ARE COMBINED

ARES CORPORATION	ENGINEERING CHANGE NOTICE SKETCH					
R f Dwg	Sh	Rev	Prep red By	Checked By	ECN No	Pag
H-2-99071	2	4	K HALE		664551	7

ZN E/6

INSTALL/ADD NEW FLOWMETER
AND ASSOCIATED ELECTRICAL
EQUIPMENT



664551-1

ARES CORPORATION — Applied Research & Engineering Sciences

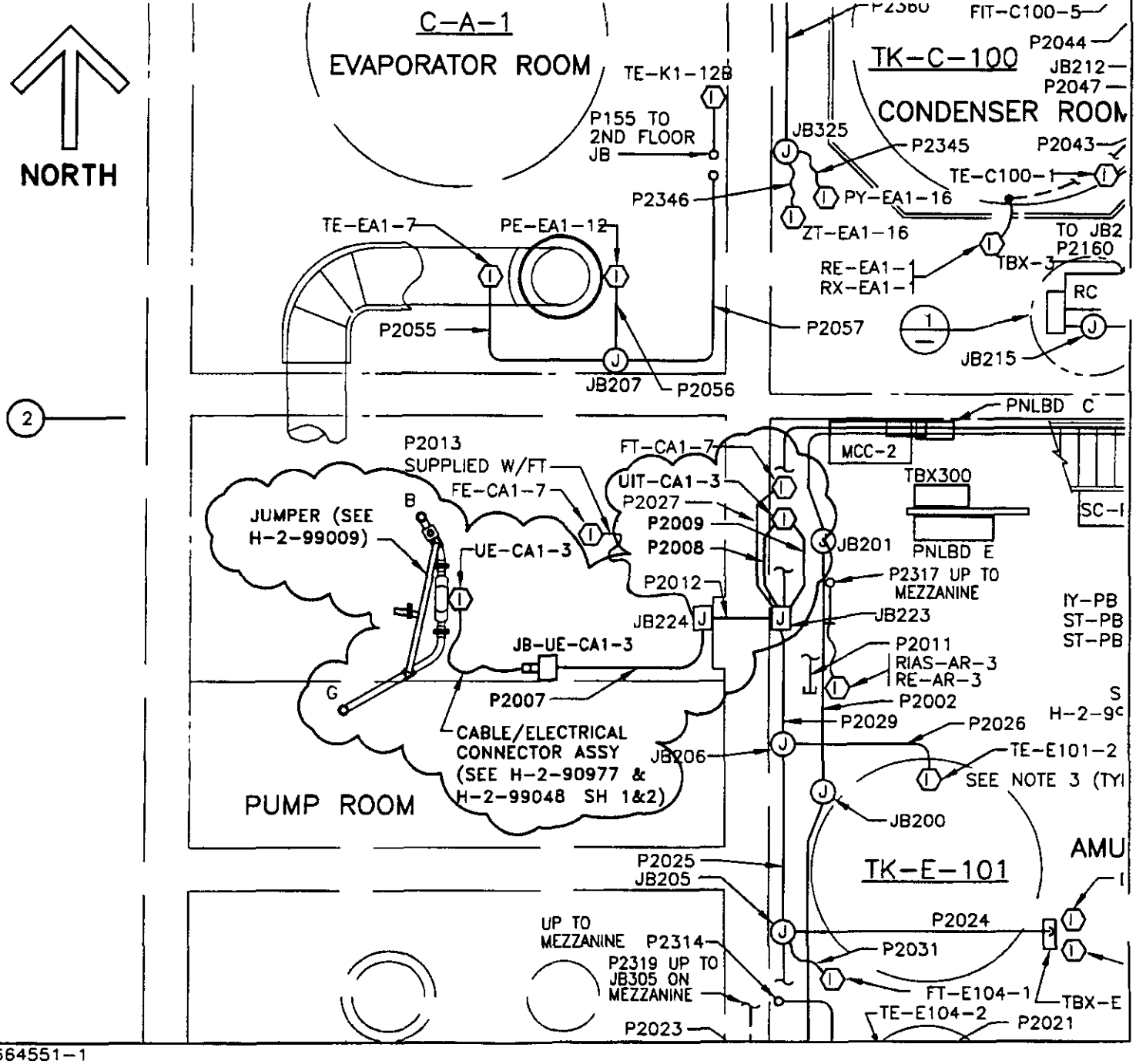
ENGINEERING CHANGE NOTICE SKETCH

Ref Dwg	Sh	Rev	Prepared By	Ch k d By	ECN N	P g
H-2-99074	1	4	K HALE		664551	8

ZN C-D/6-7

NOTE TO INSTALLER (DO NOT INCORPORATE ON DRAWING)

INSTALL/ADD NEW FLOWMETER AND ASSOCIATED ELECTRICAL EQUIPMENT MOUNT JUNCTION BOX JB-UE-CA1-3 ON PUMP ROOM SOUTH SHELF WALL 4 -6 MAXIMUM ABOVE FINISHED FLOOR AND NEAR TO JUMPER G-B NEW FLOW MASS DENSITY METER UE-CA1-3 USE RIGID OR IMC TYPE CONDUIT AND FITTINGS APPROPRIATE FOR WET LOCATION INSTALLATION I E -MYERS HUB/GASKETED LB FITTINGS



ARES CORPORATION — Applied Research Engineering Solutions

ENGINEERING CHANGE NOTICE SKETCH

R f Dwg	Sh	Rev	Prep red By	Checked By	ECN N	P g
SEE BELOW	–	–	K HALE		664551	9

H-2-99048, SH 1, REV 4, ZONE E-F/6-7

ADD THE FOLLOWING TO THE PARTS LIST

QTY	PN	DESCRIPTION	MAT'L/REF
1	172	MICROMOTION MASS FLOW AND DENSITY TRANSMITTER	RFT9739D4SUA
1	173	MICROMOTION ELITE MASS FLOW AND DENSITY SENSOR	CMF300M355NRJUEZZZ
1	174	BULKHEAD SHELL	AMPHENOL PTBE-16-99-PS
1	175	CONNECTOR SOCKET	SEE P/N 19 (H-2-90977-1)
1	176	CONNECTOR PLUG	SEE P/N 18 (H-2-90977-1)
1	177	JUNCTION BOX	HOFFMAN A-8064NFSS

H-2-99087, SH 7, REV 5, ZONE D/2-8

UPDATE THE WIRE RUN SCHEDULE TO REVISE WIRE RUN 364 AS FOLLOWS

WIRE RUN NO	NO OF WIRES	SIZE OF WIRES	TYPE OF WIRE	FROM	VIA	TO	WIRE NUMBERS
364	3	12	1	TEE	P1230 JB1230 P1313	FT-CA1-7	B20H B20N GND

UPDATE THE CONDUIT SCHEDULE TO ADD NEW WIRE RUN FOR DENSITY TRANSMITTER POWER

CND NO	CND SIZE	WIRE RUN NUMBERS
P1312	3/4	441
P1313	3/4	364

H-2-98986, SH 3, REV 2, ZONE E-/1-3

ADD MCS I D LETTER U

MCS IDENTIFICATION LETTERS					
FIRST LETTER			SUCCEEDING LETTERS		
	MEASURED OR INITIATIZING FUNCTION	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
C	CALCULATED-ó			CONTROLLER	
D	DENSITY (MASS) SPECIFIC GRAVITY	DETECTION DIFFERENCIAL			
T	TEMPERATURE				
U	MULTIVARIABLE				
V	VIBRATION				
W	WEIGHT				
X		FAILURE			
Y	EVENT STATE			RELAY	
Z	POSITION				

ARES CORPORATION — Applied Research & Engineering Advances

ENGINEERING CHANGE NOTICE SKETCH

Ref Dwg	Sh	Rev	Prepared By	Checked By	ECN No	Page
SEE BELOW	–	–	K HALE		664551	10

H-2-99087, SH 8, REV 4, ZONE C/4-8

UPDATE THE WIRE RUN SCHEDULE TO REVISE WIRE RUN 441 AS FOLLOWS

WIRE RUN NO	NO OF WIRES	SIZE OF WIRES	TYPE OF WIRE	FROM	VIA	TO	WIRE NUMBERS
441	3	14	1	JB1230	P1312	UIT-CA1-3	B20H B20N GND

H-2-99087, SH 10, REV 4, ZONE D-F/2-8

UPDATE THE WIRE RUN SCHEDULE TO ADD AS FOLLOWS

WIRE RUN NO	NO OF WIRES	SIZE OF WIRES	TYPE OF WIRE	FROM	VIA	TO	WIRE NUMBERS
2002	1	–	17	UE-CA1-3	JB-UE-CA1-3 P2007 JB224 P2012 JB223 P2008	UIT-CA1-3	VENDOR SUPPLIED CABLE
2003	3	18	2	MCS PCM 0 MUX 1	SFWW DCWW-2 PB150B PB150A P2028 JB223 P2009	UIT-CA1-3	UIT-CA1-3-1(+) UIT-CA1-3-1(-) SHLD UIT-CA1-3-2(+) UIT-CA1-3-2(-) SHLD UIT-CA1-3-3 (RTN) UIT-CA1-3-3 (CONTROL) SHLD

UPDATE CONDUIT SCHEDULE TO ADD AND REVISE WIRE RUN AS FOLLOWS

CND NO	CND SIZE	WIRE RUN NUMBERS
P2007	2	2002
P2008	3/4	2002
P2009	1/2	2003
P2012	2	2020 2002
P2028	1-1/2	2013 2014 2015 2016 2017 2018 2019 2037 2045 2003

ARES CORPORATION — Applied Research & Engineering Solutions

ENGINEERING CHANGE NOTICE SKETCH

R f Dwg	Sh	Rev	Prepared By	Check d By	ECN N	P g
H-2-99087	12	0	K HALE		664551	11

ZONE D&F/3-8

UPDATE THE WIRE RUN SCHEDULE TO REVISE WIRE RUNS 2162 AND 2185 AS FOLLOWS

WIRE RUN NO.	NO OF WIRES	SIZE OF WIRES	TYPE OF WIRE	FROM	VIA	TO	WIRE NUMBERS
2162	1	-	17	CONN 7A	P2227	TBX 2	SPARE
2185	5	18	2	MCS PCM 0 MUX 1	DCWW P2231	TBX 2	FT CA1 1(+) (-) SH FT-CA1 4(+) (-) SH ZT-CA1 3(+) ( ) SH 2 SPARE

ARES CORPORATION — Applied Research & Engineering Sciences

ENGINEERING CHANGE NOTICE SKETCH

Ref Dwg	Sh	Rev	Prepared By	Checked By	ECN No	Pag
H-2-85322	3	1	K HALE		664551	12

REVISE PANELBOARD B CIRCUIT 20 TO
ADD NEW POWER LOAD OF 15 VOLT-AMPS
FOR FLOW MASS DENSITY
METER/TRANSMITTER UIT-CA1-3

SCRIPTION	NO	NO		NO	NO	LOAD DESCRIPTION	PH A	PH B	PH C	NUMBER	REMARKS
E F G		1	20	2		RCPT RM 1 3 4 & EXH FAN	1080				
& INST ENCL		3	20	4		RECEPTACLES RM 1 & 3		360			
C		5	20	6		RCPT RM 3 4 13 & 15			720		
A & C		7	20	8		RECEPTACLES RM 5 13 & 15	1600				
C		9	20	10		RCPT RM 6 8 9 & 12		900			
P-RC3-2		11	20	12		SEAL WATER PUMP P-C 105 (1/2 HP)			1130		
& MTR K1 7 1		13	20	14		RCPT RM 2 4 9 & 18	720				
& MTR K2-7-1		15	20	16		RCPT RM 2 6 11 12 & 16		900			
PT & FAN K1 8-1		17	20	18		P-E 102 (1/4 HP) AMU ROOM			1850		
RM D		19	20	20		TRANSMITTERS & UIT-CA1-3	615				
GE		21	40	22		HOT WATER HEATER #1		4000			
		23		24					4000		
& G		25	20	26		PUMP P-RC1 1 (1/3 HP)	820				
CHEN		27	20	28		HEAT TRACE AIR INTAKE LOUVER		TBD			
FEED SAMP LEAK DET		29	20	30		SEAL POT 241 A A & B ALARM			TBD		
G 242-AB		31	20	32		FIRE SYSTEM SUPPLY FAN SHUTDOWN	1100				
CESS		33	20	34		ION EXCHANGE COLUMN HEATER		480			
SL-114		35		36					480		
		37	20	38		RECEPTACLES RM 9	500				
		39	40	40		HOT WATER HEATER #2		4000			
WALL, CONT RM)		41	20	42		(ROOM 16)			4000		
						SUBTOTAL	6435	10640	12180		

L WATTS PHASE A 14715
L WATTS PHASE B 22700
L WATTS PHASE C 21920
TOTAL 59335

ESSENTIAL DRAWING

DESCRIPTION	REV BY DATE	CHK BY DATE	DFTG APVD DATE	ENGR / COMPANY
INCORPORATED ECN-654926 & ECN-654943	BAM 2/01			

REVISIONS

DRAWN VJ BENDER	DATE 3/94	U S DEPARTMENT OF ENERGY DOE Field Office Richland Westinghouse Hanford Company
CHECKED G TILLEY	3/94	
DFTG APVD WD COLEMAN	3/94	PANELBOARD SCHEDULE
COG ENGR J BERGER	3/94	
APPVD PAUL ULK	3/94	SIZE B · BLDG NO 242 A · INDEX NO 7304 · DWG NO H-2-85322 · REV 1
APPVD		SCALE NONE · EDT 700012 · SHEET 3 OF
APPVD		

CHK PRINT ☐ COMMENT PRINT ☐

FOR FIELD VERIFICATION STATUS SEE REV 1

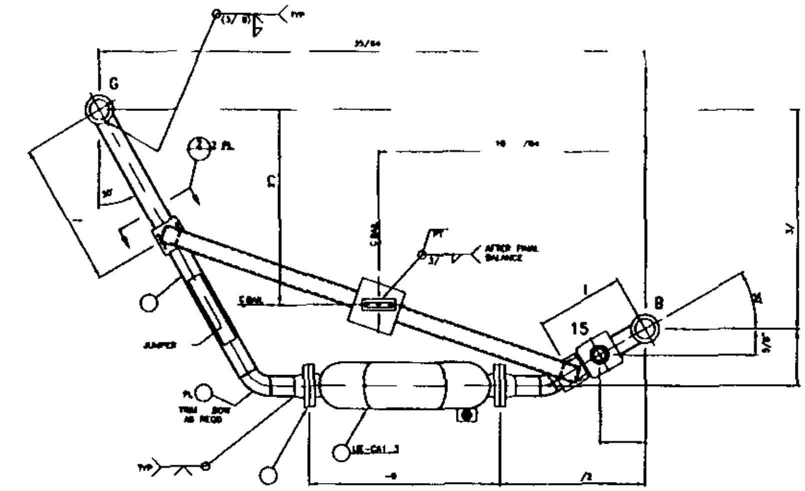
SH 3 OF

DWG NO H-2-85322

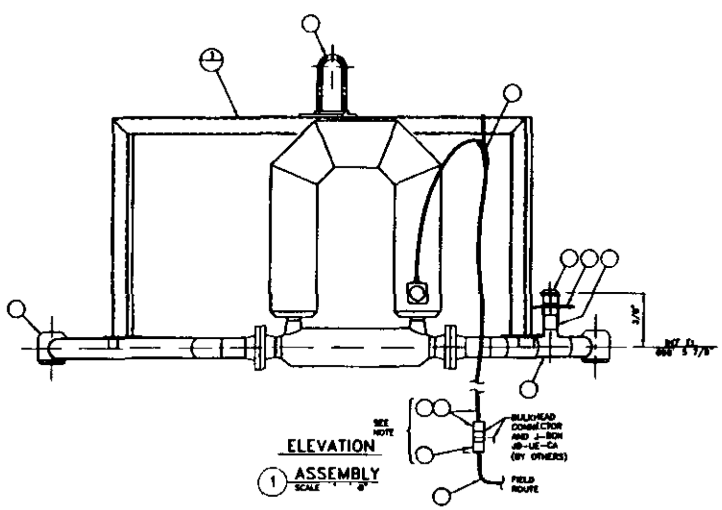
ARES CORPORATION — Applied Research & Engineering Sciences

ENGINEERING CHANGE NOTICE SKETCH

Dwg	Sh	Re	Approved By	Checked By	ECN No	Page
H-2-90977	1	1	JR BYERS		664551	13

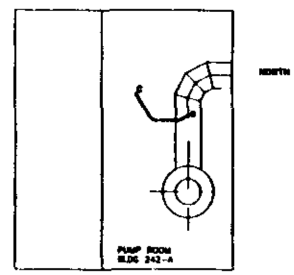


PLAN

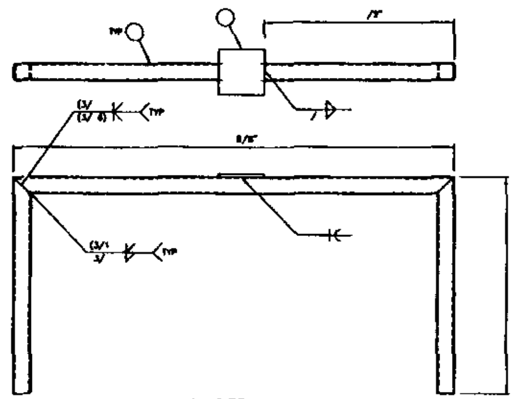


ELEVATION

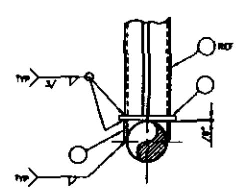
(1) ASSEMBLY
SCALE



KEY PLAN
SCALE: NONE



(1) DETAIL
SCALE



(2) DETAIL
SCALE: NONE

PARTS/MATERIAL LIST					
QTY REQD	PART/DASH NUMBER	NOMENCLATURE/DESCRIPTION	MATERIAL/REFERENCE	SHT	ITEM NO.
X		ASSEMBL			
	H- 2430-	CONN VERT PH	GASKET TYPE		
	H- 2440	NOZZLE, PURGE PH			
	30600-	CKPLA 90 PH			
	90	LIFTING BAIL CS, PH			
AR		PIPE SCHED 40S, SEAMLESS	ASTM 304L		
AR		PIPE SCHED 40S SEAMLESS	ASTM OR 304L		
		BUSHING	ASTM A-B 304L		
		ELBOW SCHED 40S 90 [illegible]	ASTM A403 [illegible] 304L		
		FLANGE [illegible] WELDING	ASTM [illegible] 304L		
		METER	SEE NOTE		
		[illegible]	ASTM A240 304/304L		
		PLATE	ASTM A240 TYPE 304L		
		PLATE /8	TYPE A240 TYPE 304L		
		PLA /7	TYPE A240 TYPE 304L		
		STRAIN [illegible] UNIVERSAL EYE OSFD SH SINGLE WEAVE	[illegible] CA NO 87220		
00		ELECTRICAL CABLE, CONDUCTOR	MICROMOTION CAT NO CPL 108		
		ELECTRICAL CONNECTOR PLUG	AMPHENOL PT06E 99 -(003)		
		ELECTRICAL CONNECTOR SOCKET	AMPHENOL PT06E -99-S-(003)		

CONTACT ARRANGEMENT

PLUG AND SOCKET WIRING TABLE			
CONTACT	AWG GAUGE	CONDUCTOR COLOR	NOTE
A	22	BLUE	
B	22	GRAY	
C	22	DRAIN WIRE/SHLD	
D			NOT USED
E			NOT USED
F	22	GREEN	
G	22	WHITE	
H	22	DRAIN WIRE/SHLD	
J			NOT USED
K			NOT USED
L	22	YELLOW	
M	22	VIOLET	
N	22	ORANGE	
P	22	DRAIN WIRE/SHLD	
R			NOT USED
S			NOT USED
T			NOT USED
U			NOT USED
V			NOT USED
W	8	BROWN	
X	22	DRAIN WIRE/SHLD	
Y			NOT USED
Z	18	RED	

NOTES

FABRICATION AND TESTING SHALL BE ACCORDANCE WITH ASME B3 PROCESS PIPING, CATAGORY NORMAL. IN-PROCESS EXAMINATION SHALL BE SUBSTITUTED FOR REQUIRED RADIOGRAPHY. WELDING SHALL BE ACCORDANCE WITH AWS (DAMAGE WELDING), STRUCTURAL WELDING CODE STAINLESS STEEL. WELDER PROCEDURES QUALIFICATIONS ASME SECTION ARE ACCEPTABLE.

JUMPER ASSEMBL WEIGHT (APPROX) 520 LBS

PAINT LIFTING BAIL (ITEM WITH AMERLOCK 400 PER MANUFACTURER INSTRUCTIONS. FINISH COLOR SHALL YELLOW

METER SHALL BE MICROMOTION ELITE MASS FLOW AND DENSITY METER, WITH ANSI CLASS 50 WELD NECK RAISED FACE FLANGES APPROXIMA WEIGHT 65 LBS PART NUMBER CMF300M355NRAUEZZZ TAG NUMBER UE-CA

HYDROST TIC TEST 200-220 PSIG.

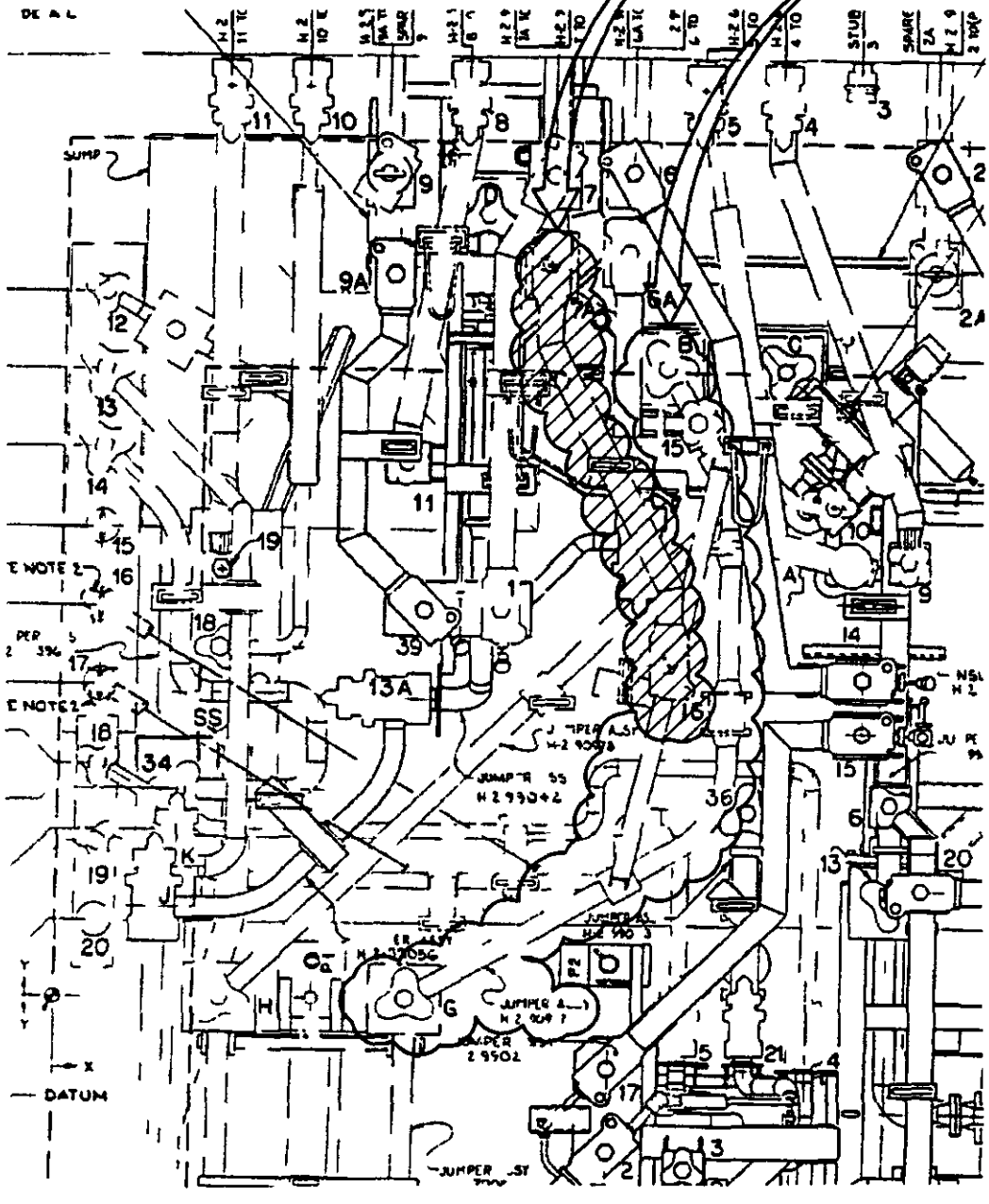
FIELD ROUTE ELECTRICAL CABLE TO JUNCTION BOX JB-UE CA CABLE LENGTH TO BE APPROXIMATEL 30'-0" TERMINATE CONDUCTORS ON AMPHENOL PLUG AND SOCKET PER CONTACT ARRANGEMENT AND PLUG AND SOCKET WIRING TABLE SEE DRAWING H- -990 SHEET

DRAFTING NOTE
DO NOT REDUCE PRINT SIZE

ARES CORPORATION			ENGINEERING CHANGE NOTICE SKETCH			
Ref Dwg	Sh	R	Prepared By	Check d By	ECN N	Pag
H-2-99009	1	2	JR BYERS		664551	14

REMOVE ELECTRICAL JUMPER 7A-16

MODIFY JUMPER G-B (16) (15)
SEE PAGE 13



ARES CORPORATION — Applied Research & Engineering Solutions

ENGINEERING CHANGE NOTICE SKETCH

Ref Dwg	Sh	Rev	Prepared By	Checked By	ECN No	Pag
–	–	–	K HALE		664551	15

NOTE. For information only DO NOT INCORPORATE ON DRAWING

Date	7/9/2001			Sheet	1	of	1
Company		Coriolis Multivariable		Spec No		Rev	0
Service		Instrument Data Sheet		Contract		P O	
				Req		By	MFG
Manufacturer	Micro Motion Inc			Chk'd	DPM	App	DSH

Service	1	Sensor Tag( )		UE-CA1-3				
	2	Transmitter Tag(s)		UIT-CA1-3				
	3	Fluid State	Fluid Name	Slurry	NUCLEAR WASTE			
	4	Flow	Min | Operating | Max | Design	0 000	160 000	300 000		USGPM
	5	Pressure	Min | Operating | Max | Design	0 000	20 000	35 000		psig
	6	Temperature	Min | Operating | Max | Design	40 000		200 000		F
	7	Specific Gravity or Density (max)		1 80000 g/cm3				
	8	Viscosity (max)		100 00 cP				
Sensor	9	Manufacturer and Model Number		Micro Motion CMF300M355NRJUEZZZ				
	10	Description		Micro Motion Coriolis ELITE sensor 3 inch 316L stainless steel				
	11							
	12							
	13							
	14	Process Connections		3-inch ANSI 150 lb weld neck raised face flange				
	15	Approval		UL				
	16	Wetted Parts		316L stainless steel				
	17	Mass Flow Accuracy @ Max Flow (% of rate)		0 11%				
	18	Density Accuracy @ All Rates		0 0005 g/cm3				
	19	Pressure Drop @ Max Flow		4 008 psi				
	20	Calibration Type | Rate | Units						
	21	Custom Calibration Points		5 point calibration for massflow				
	22	Density for Volume to Mass Conversion						
	23	Special Unit Text | Totalizer Text						
	24	Base Units Flow | Time | Conversion						
	25	Sensor Notes						
Transmitter	26	Manufacturer and Model Number		Micro Motion RFT9739D4SUA				
	27	Description		Coriolis multivariable transmitter remote				
	28			field mount with display NEMA 4X				
	29							
	30							
	31	Input Power		85 250 VAC				
	32	Approval		UL				
	33	Transmitter Flow Unit Mass | Volume			GPM				
	34	Transmitter Units Density | Temperature		g/ m3				
	35	Special Mass Units Text | Totalizer Text						
	36	Base Mass Units Flow | Time | Conversion						
	37	Special Voulme Units Text | Totalizer Text						
	38	Base Volume Units Flow | Time | Conversion						
	39	Output 1 Type | Variable		4 20 mA	Volumetric Flow			
	40	Output 1 Scaling | LRV | URV | Units		0 300 GPM				
	41	Output 2 Type | Variable		4 20 mA	Density			
	42	Output 2 Scaling | LRV | URV | Units		0 3 g/cm3				
	43	Output 3 Type | Variable		15 VDC	Failure Alarm			
	44	Output 3 Setting | Rate | Units		0 VDC or 15 VDC	0 VDC indicates transmitter sensor failure			
	45	Transmitter Note						
Cable	46	Manufacturer and Model Number		Micro Motion CPLTA1A100				
	47	Description		Armoured cable PVC insulation braid overall stainless				
	48			steel shield 100 ft (30 m)				
Notes	49							
	50							
	51							
	52							
	53	Peripheral Tag(s)		Tag sensor and transmitter with stainless steel tag				
	54	Operations and Maintenance Manual		Supply operations and maintenance manual				

664551–1

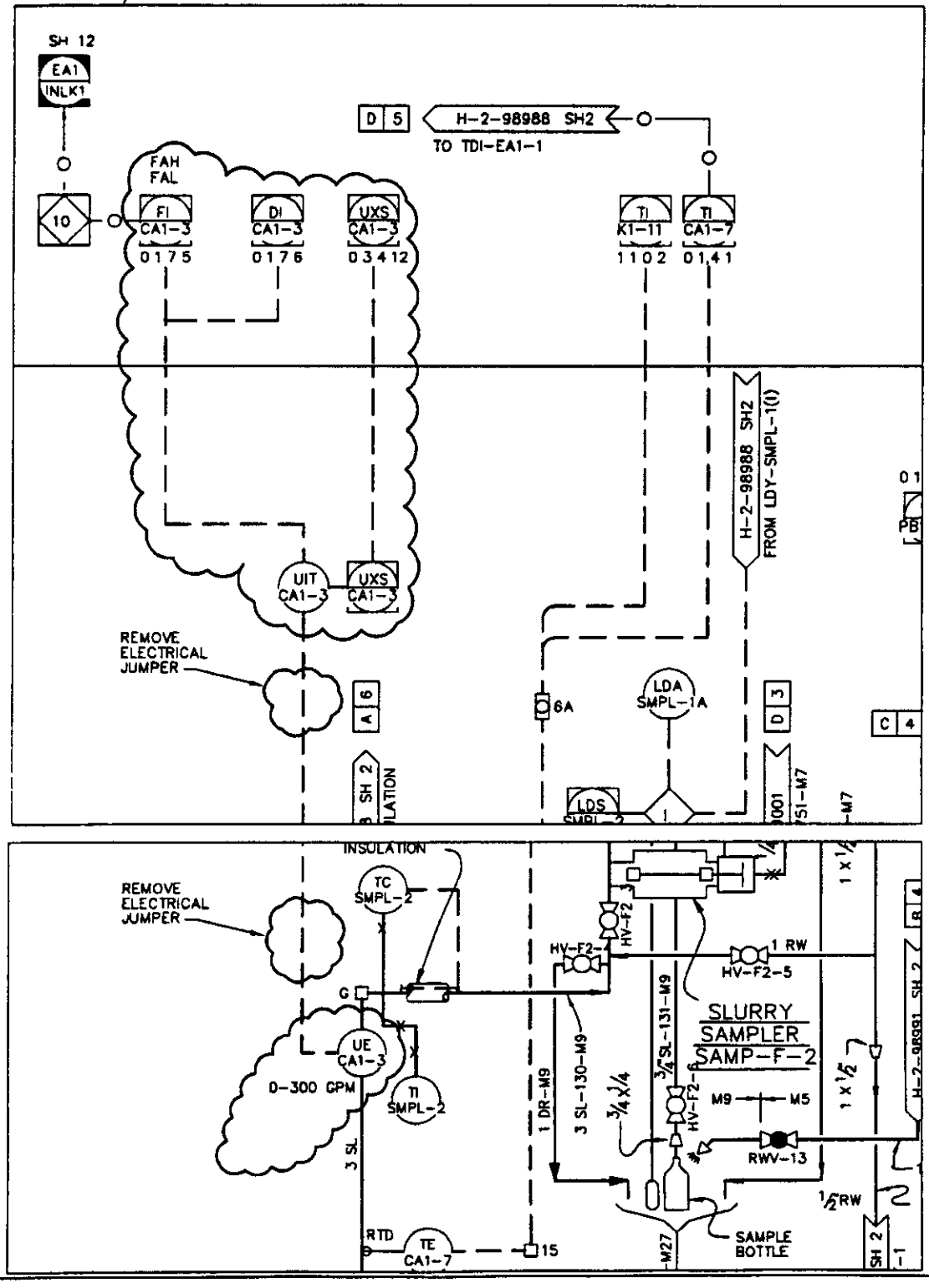
ARES CORPORATION — Applied Research Engineering Sciences

ENGINEERING CHANGE NOTICE SKETCH

Ref Dwg	Sh	Rev	Prepared By	Checked By	ECN N	Pag
H-2-98989	1	11	K HALE		664551	16

ZONE A-E/8

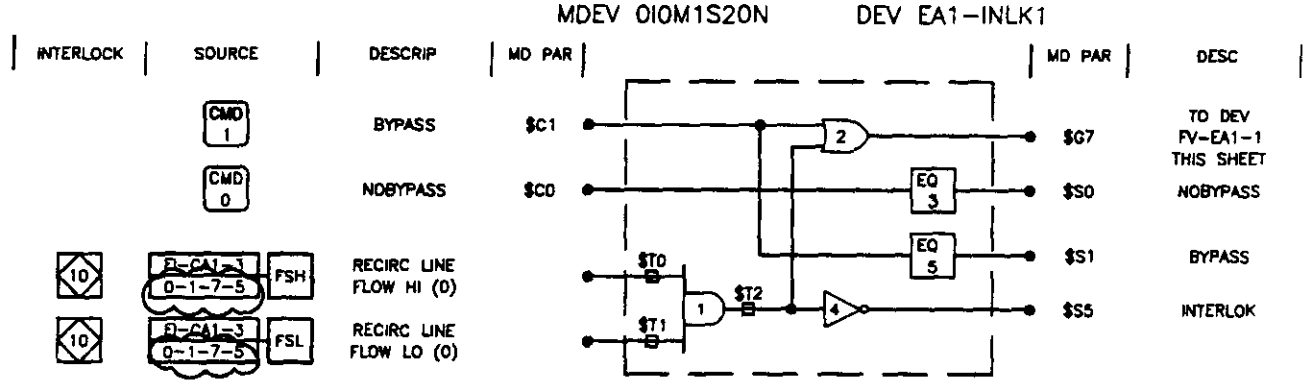
REVISE FLOW METER TAGS TO SHOW NEW FLOW MASS DENSITY METER/TRANSMITTER UE/UIT-CA1-3 NUMBERS



ARES CORPORATION				ENGINEERING CHANGE NOTICE SKETCH		
R f Dwg	Sh	Rev	Prepared By	Checked By	ECN N	Pag
H-2-99949	12	1	R E WILSON		664551	17

ZONE B/4

REVISE PCM MULTIPLIXER BOARD AND POINT ADDRESSES ON LOGIC DIAGRAM



S

ESSENTIAL

ENGINEERING CHANGE NOTICE

CPr 13A & 13B

Page 1 of 34

1 ECN 664553

Proj ECN

2 ECN Category (mark one)	3 Originator's Name Organization MSIN and Telephone No	4 USQ Required?	5 Date
Supplemental (●)	David S Haring ARES Corporation 946 8946	(●) Yes ( ) No	07/26/01
Direct Revision ( )			
Change ECN ( )			
Temporary ( )			
Standby ( )			
Supersedure ( )			
Cancel/Void ( )			

6 Project Title/No./Work Order No	7 Bldg /Sys /Fac No	8 Approval Designator
242 A Evaporator Life Extension Upgrades	242 A	T Q N

9 Document Numbers Changed by this ECN (includes sheet no and rev)	10 Related ECN No(s)	11 Related PO No
See Block 13a	N/A	N/A

12a Modification Work	12b Work Package No	12c Modification Work Completed	12d Restored to Original Condition (Temp or Standby ECNs only)
(●) Yes (fill out Blk 12b) ( ) No (NA Blks 12b 12c 12d)	EL-01-00451	Design Authority/Cog Engineer Signature & Date	N/A Design Authority/Cog Engineer Signature & Date

13a Description of Change — 13b Design Baseline Document? (●) Yes ( ) No

H-2-99043 Sh 1 Rev 2 Jumper has been redesigned with a manual ball valve and two pressure taps to be used for testing Replace existing design shown on this drawing (including material list and notes) with new design shown on page 3 of this ECN

H 2 98989 Sh 1 Rev 11 add Valve HV PB2 1 and pressure taps as shown on Page 4 of this ECN

USQ # LW-01-031

14a Justification (mark one)	14b Justification Details
Criteria Change ( )	This change is required in order to support the 242-A Evaporator Life Extension activities
Design Improvement (●)	
Environmental ( )	
Facility Deactivation ( )	
As-Found ( )	
Facilitate Const ( )	
Const Error/Omission ( )	
Design Error/Omission ( )	

15 Distribution (include name MSIN and no of copies)

CD Skogley	S6 71	(1)	WCC Planning	S6 72	(1) *
EA McNamar	S6 72	(1)*			
DL Flyckt	S6 71	(1)			
NJ Sullivan	S6 72	(1)			
MC Teats	S6 72	(1)			
RW Szelmeczka	S6 72	(1)			
JM Isdell	B4 39	(1)			
MW Bowman	S6 72	(1)			

RELEASE STAMP

AUG 22 2001

DATE:

STA. 30

HANFORD RELEASE ID: 25

ENGINEERING CHANGE NOTICE

1 ECN (use no from pg 1): 664553

16 Design Verification Required: Peer Review — (●) Yes ( ) No

17 Cost Impact

	ENGINEERING	CONSTRUCTION
Additional	( ) $ N/A	( ) $ N/A
Savings	( ) $ N/A	( ) $ N/A

18 Schedule Impact (days)

Improvement	( ) N/A
Delay	( ) N/A

19 Change Impact Review Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13 Enter the affected document number in Block 20

SDD/DD	[X]	CAM	Seismic/Stress Analysis	[ ]		Tank Calibration Manual	[ ]
Functional Design Criteria	[ ]	8-8-01	Stress/Design Report	[ ]		Health Physics Procedure	[ ]
Operating Specification	[ ]		Interface Control Drawing	[ ]		Spares Multiple Unit Listing	[ ]
Criticality Specification	[ ]		Calibration Procedure	[ ]		Test Procedures/Specification	[ ]
Conceptual Design Report	[ ]		Installation Procedure	[ ]		Component Index	[ ]
Equipment Spec	[ ]		Maintenance Procedure	[X]	CAM 8-8-01	ASME Coded Item	[ ]
Const. Spec	[ ]	N/A	Engineering Procedure	[ ]		Human Factor Consideration	[ ]
Procurement Spec	[ ]		Operating Instruction	[ ]		Computer Software	[ ]
Vendor Information	[ ]		Operating Procedure	[X]		Electric Circuit Schedule	[ ]
OM Manual	[ ]		Operational Safety Requirement	[ ]		ICRS Procedure	[ ]
FSAR/SAR	[ ]		IEFD Drawing	[ ]		Process Control Manual/Plan	[ ]
Safety Equipment List	[ ]		Cell Arrangement Drawing	[ ]		Process Flow Chart	[ ]
Radiation Work Permit	[ ]		Essential Material Specification	[ ]		Purchase Requisition	[ ]
Environmental Impact Statement	[ ]		Fac. Proc Samp Schedule	[ ]		Tickler File	[ ]
Environmental Report	[ ]		Inspection Plan	[ ]		_____	[ ]
Environmental Permit	[ ]		Inventory Adjustment Request	[ ]		_____	[ ]

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

Document Number/Revision	Document Number/Revision	Document Number/Revision
N/A CAM 8-21-01		
TD-600-010		

21 Approvals

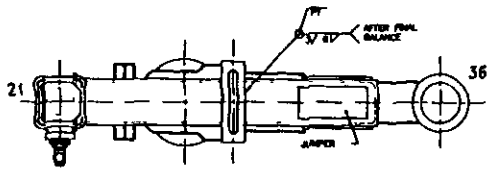
	Signature	Date		Signature	Date
Design Authority	E.A. McLaren	8-8-01	Design Agent		
Cog Eng	N.J. Sullivan for E.A. McLaren	8-8-01	PE		
Cog Mgr	K.C. Huckfeldt	8-13-01	QA		
QA	M.J. Wiley	8/14/01	Safety		
Safety			Design		
Environ			Environ		
Other	Nuclear Safety J.B. Rockhold for	8-21-01	Other		
Peer Review	Mac Teats	8/13/01			

DEPARTMENT OF ENERGY

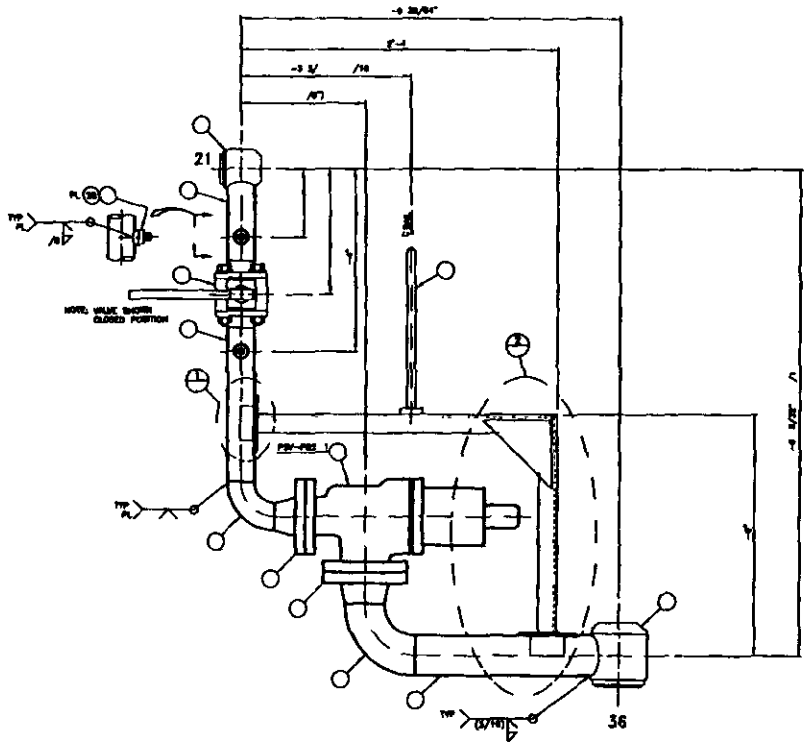
Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

ARES	ENGINEERING CHANGE NOTICE SKETCH				
of Dwg	Sh	Rev	Prepared By	Checked By	ECN No	Page
H-2-99043	1	2	JR BYERS	DS HARING	664553	3

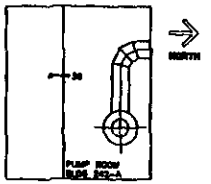


PLAN



ELEVATION

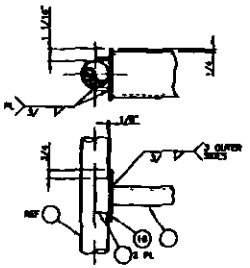
① ASSEMBLY
SCALE 3" = 1'-0"



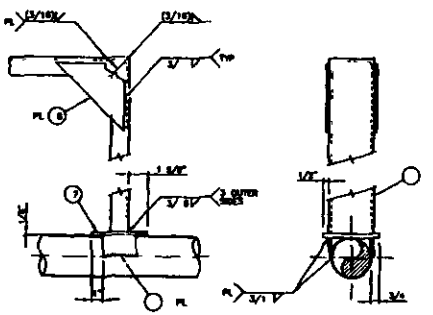
KEY PLAN
SCALE: NONE

PARTS/MATERIAL LIST

ITEM	PART/DASH NUMBER	NOMENCLATURE/DESCRIPTION	MATERIAL/REFERENCE	QNT	WT (LBS)
	-010	ASSEMBLY			
	H- -32420-	CONN, VENT 2" ASSEMBLY	GASKET TYPE		
	H-2-32430-	CONN, VENT 3" ASSEMBLY	GASKET TYPE		
	H-2-60	LIFTING BAR, SST ASSEMBL			
		VALVE, SAFETY RELIEF (PSV-#02-3000) SAE	SEE NOTE		
		BALL VALVE,	SEE NOTE		
AR		PIPE, SCHED 40S, SEAMLESS	ASTM A5 GR TP 304L		
AR		PIPE, SCHED 40S, SEAMLESS	ASTM GR 304L		
		ELBOW, SCHED 40S 90° SR	ASTM A403 WP-S 304L		
		ELBOW, 3" SCHED 40S 90° SR	ASTM A403 WP-S 304L		16
		FLANGE, 2" CLASS 300 WELDNECK	ASTM A182 304L		
		FLANGE, CLASS 30 WELDNECK	ASTM A182 304L		
AR		CHANNEL, C4x5.	ASTM A276		
		PLATE, 1/4 3/ SST	ASTM A240 TYPE 304L		
		PLATE, /4 3/ SST	ASTM A240 TYPE 304L		
		PLATE, /4 /2" /2" SST	ASTM A240 TYPE 304L		
		PLATE, SST	ASTM A240 TYPE 304L		
		GUSSET PLATE, 1/4 6" 60°	ASTM A240 TYPE 304L		
		THREADOLET, /4" NPT	ASTM A182 304L		19
		PIPE PLUG, / NPT SST	CAJON # SS-4-P		32



① DETAIL
SCALE: NONE



② DETAIL
SCALE: NONE

NOTES

FABRICATION AND TESTING SHALL BE ACCORDANCE WITH ASME B31.3, PROCESS PIPING, CATAGORY NORMAL. IN-PROCESS EXAMINATION SHALL BE SUBSTITUTED FOR REQUIRED RADIOGRAPHY WELDING SHALL BE ACCORDANCE WITH AWS (GUIDANCE WELDING), STRUCTURE, WELDING CODE-STAINLESS STEEL. WELDER PROCEDURES QUALIFICATIONS PER ASME SECTION ARE ACCEPTABLE.

JUMPER ASSEMBLY WEIGHT (APPROX) 342 LBS

PAINT ALL EXPOSED CARBON STEEL SURFACES WITH AMERLOCK 400 PER MANUFACTURER'S INSTRUCTIONS. FINISH COLOR SHALL BE GREY PAINT TOP INCHES OF LIFTING BAR (PEN YELLOW FOR TARGETING.

SAFETY RELIEF VALVE (PSV #) SHALL BE CROSBY STYLE JLT-400-JS-B-4 WITH ORIFICE AND BLANK-H "K" RINGS. VALVE SHALL BE SET TO OPEN AT 150 PSIG.

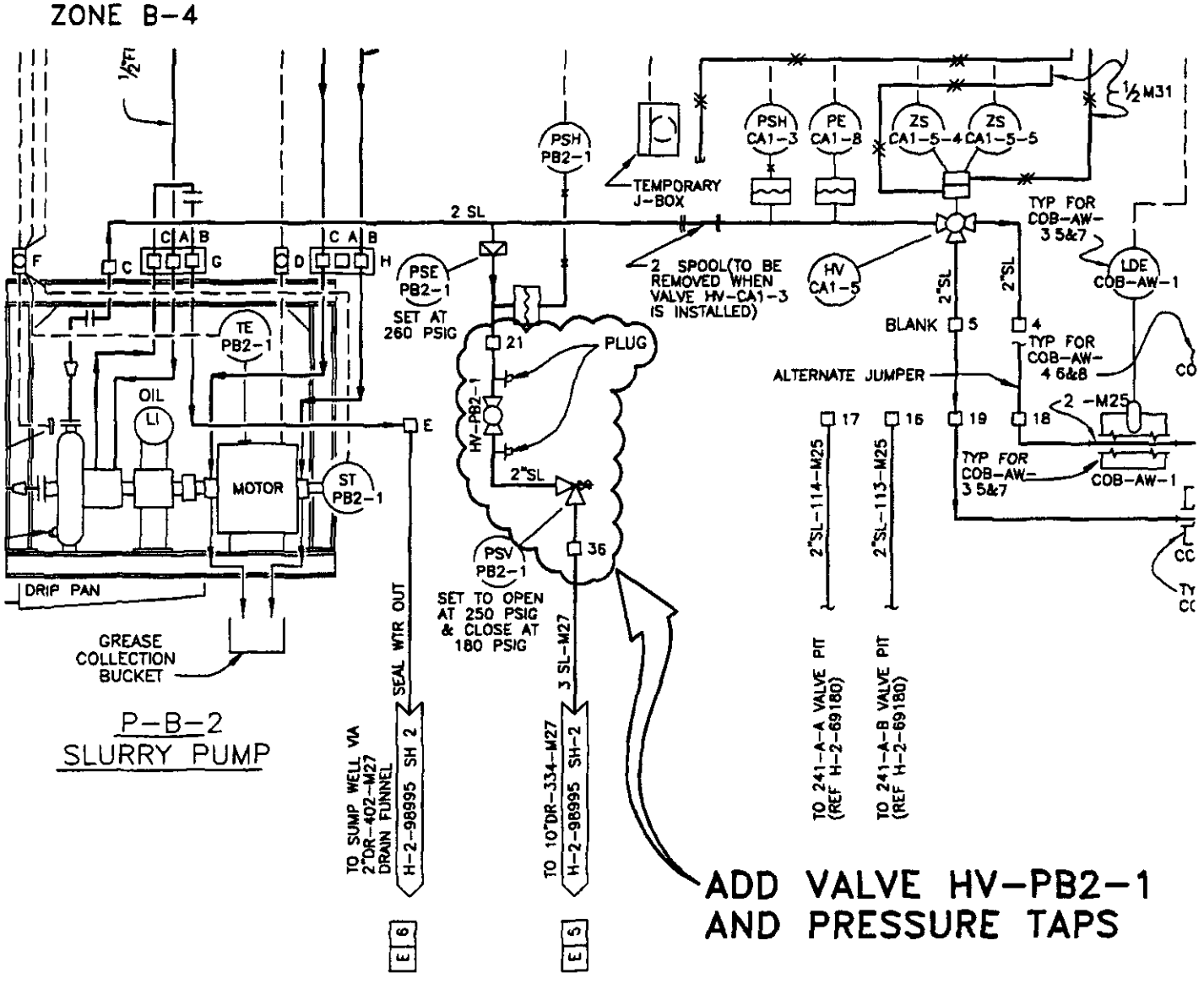
BALL VALVE SHALL BE FULL PORT WITH BUTT WELD (SCHED 40) END CONNECTIONS, AND LOCKING HANDLE. MATERIAL SHALL BE SST BODY BALL SPIRAL WITH REINFORCED TFE SEAT AND TFE BODY SEAL. WORCESTER PART NUMBER -150-8-S-R- -0004, OR APPROVED EQUAL.

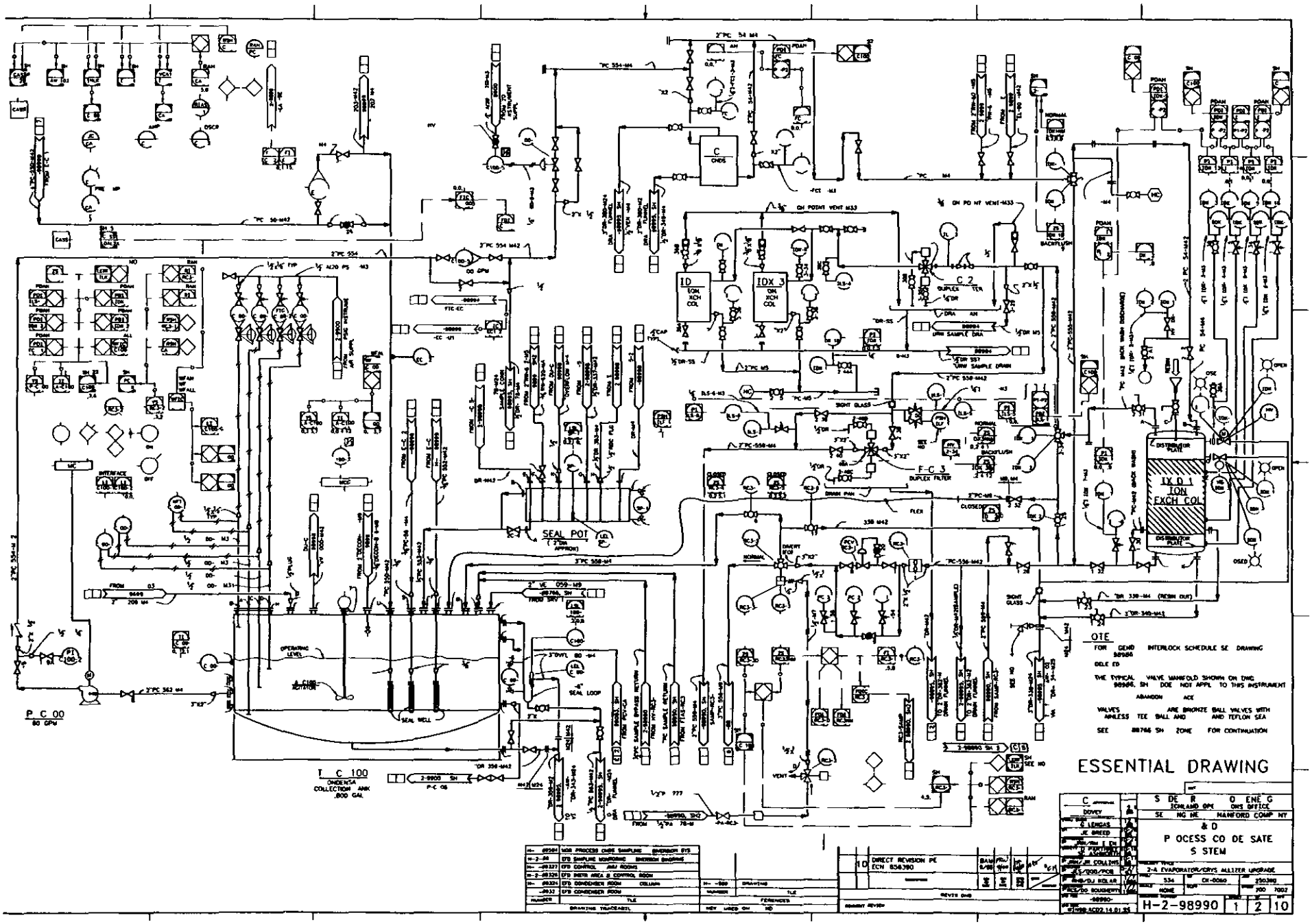
HYDROTEST JUMPER 420 PSI UPSTREAM OF SAFETY RELIEF VALVE AND 200 PSI DOWNSTREAM.

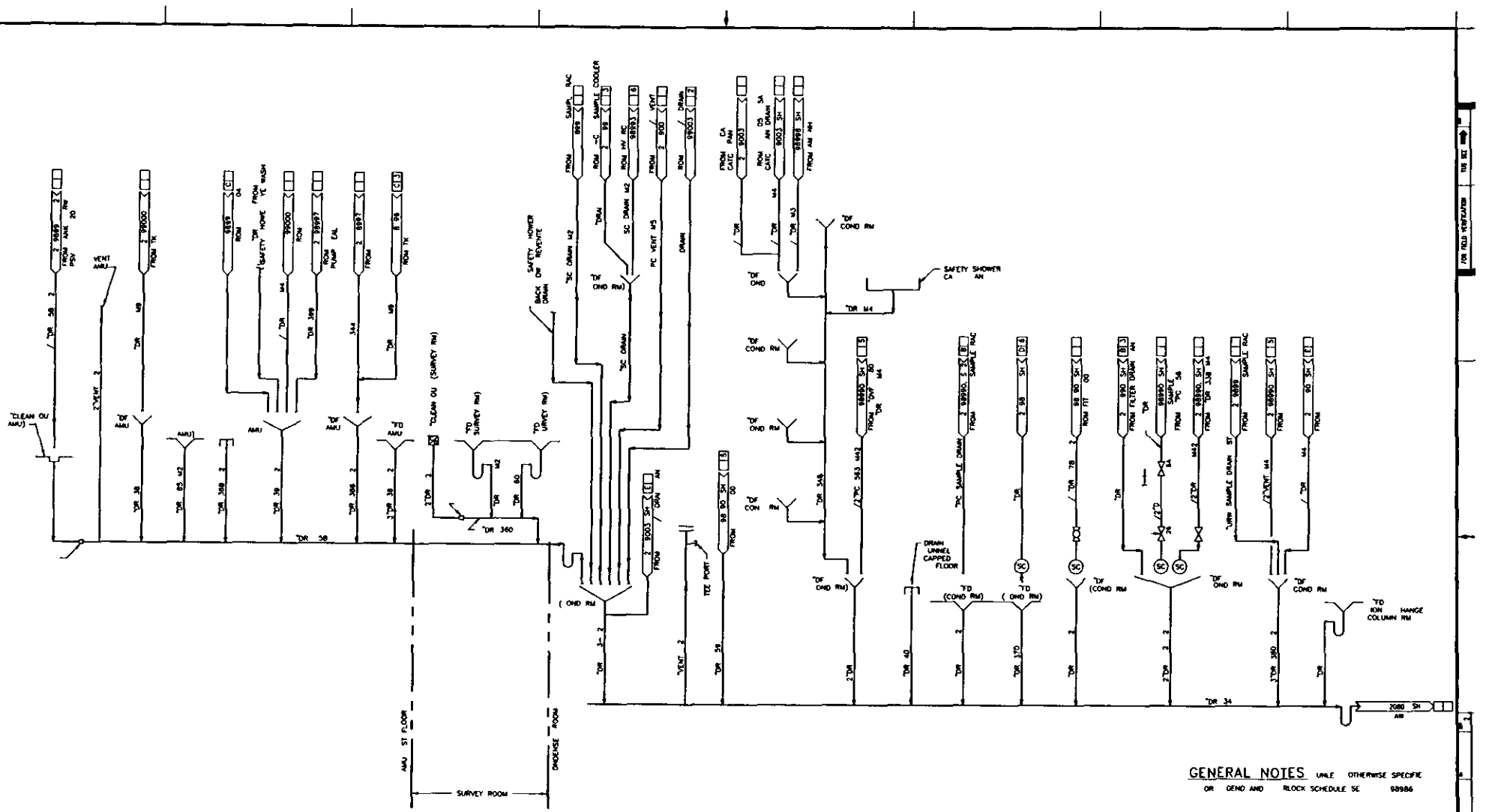
ARES CORPORATION

ENGINEERING CHANGE NOTICE SKETCH

R f Dwg	Sh	Rev	Prepared By	Ch ck d By	ECN N	P g
H-2-98989	1	11	JR BYERS	M WHITE	664553	4




ESSENTIAL DRAWING
SEAL POT
SEAL WELL
SEAL LOOP
P C 00
80 GPM
T C 100
ID
IDX 3
C 2
F-C 3
IX D 1
ION EXCH COL
DIRECT REVISION PE
ECN 654390
H-2-98990



GENERAL NOTES

UNLE OTHERWISE SPECIFIE

OR GEND AND RLOCK SCHEDULE SE 98986

990	PUMP ASSEMBL
900	&ND TERE RAW ER
9900	JET GANG VALVE SYS
9900	&ND PROCESS INSTR AR
99000	P&ND AN -FOAM SYSTE
98998	&ND VE SEL VENT SYS
980	&ND ELUANT SYS
98996	DECONTAMINA ION SYS
8899	USE RAW WATER SYS
8898	STEAM CONDENSATE
8896	&ND RAW WA SYSTEM
98890	&ND PROCESS CONDENSATE
88889	&ND SLURRY SYS
98988	P&ND EVAP RECIRC SYSTE
98986	LEGEND INT SCHED
7038	EFD AN TANK ARN
69	PIPING ARR PUMP ROOM
6970	DRAWING IST

	EFD INS RUMENT AREA
69	FD CONDENSER ROOM
69	FD PUM EVAP ROOMS

RV NUMBER	TITLE
	REVICES
USED ON END ITEM	

12	INCORPORATED CN 86 30

CADFILE VISIONS CADCODE

DJ KOLAR	12/2/86
JE /DOD	/80
JRN/JRG	/80
LENGAS	/80
JE BRE	/86
RM ITE	/86
PAR HRES	/86
SC ASHWORTH	/86
DL PECK	/86
J DOVE	2/88

ESSENTIAL DRAWING

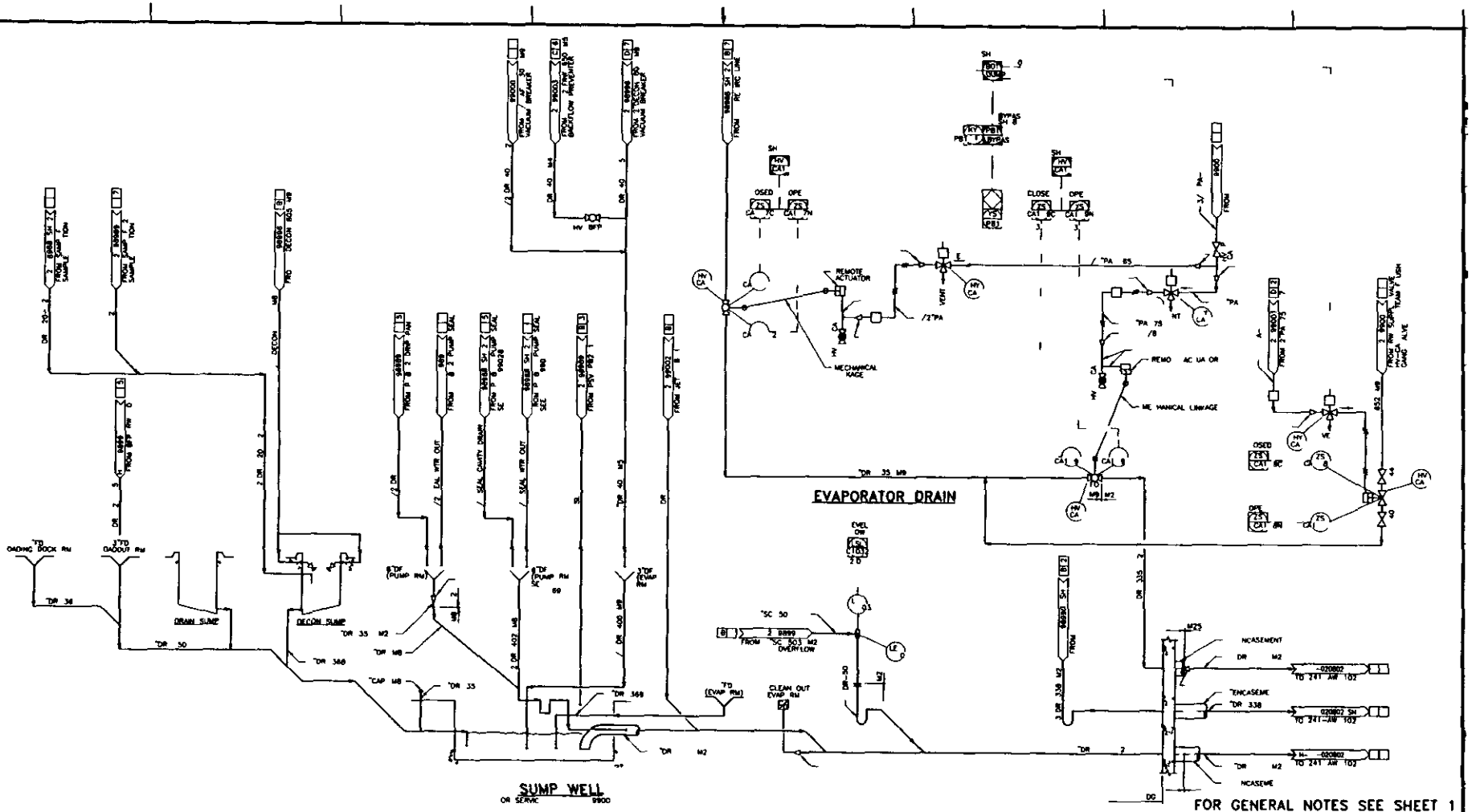
DE ARTMENT OF NERG
RICHLAND, WASHINGTON

P& D
DRAIN
SYSTE

H-2-98995 12

F NONE 10 62

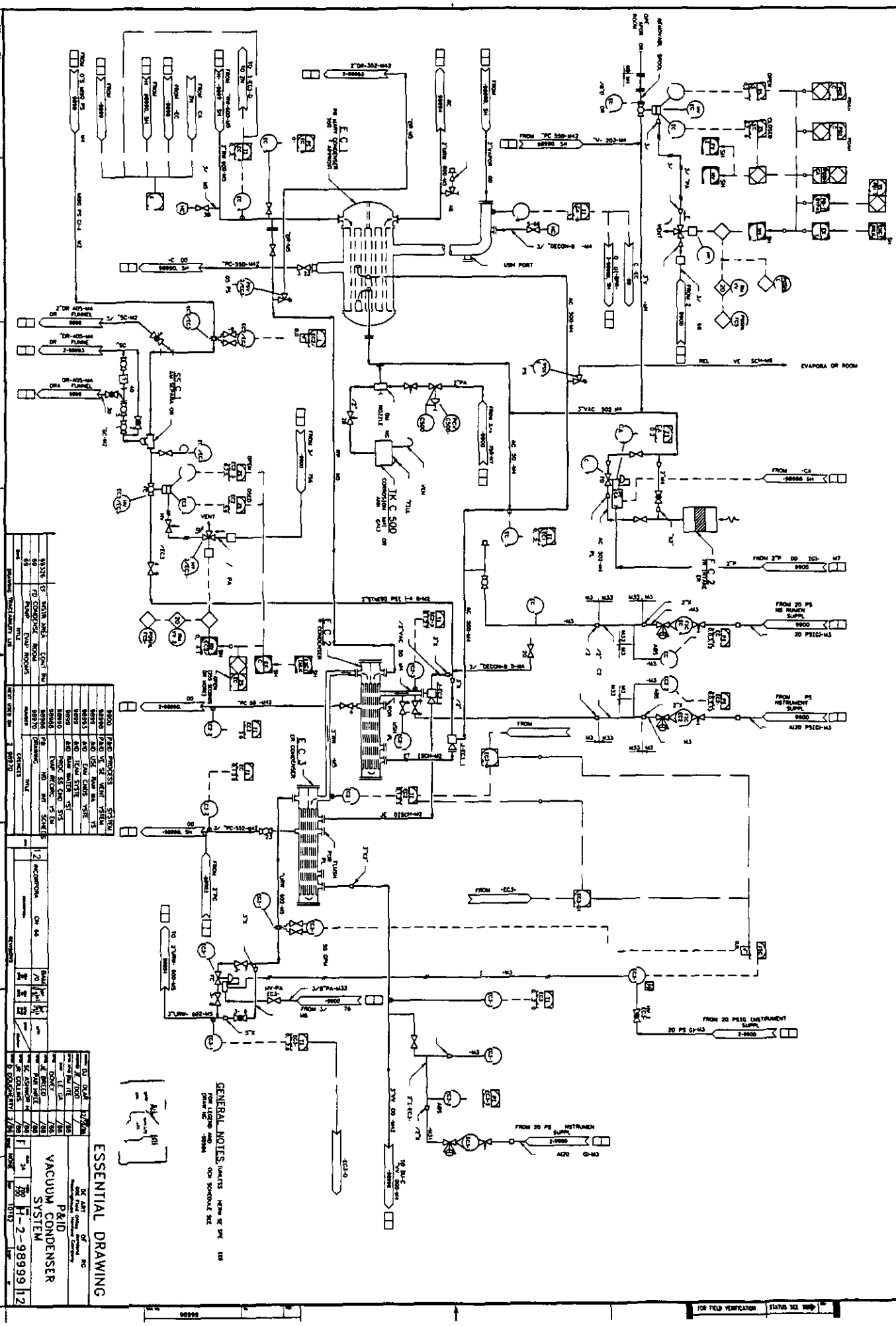
9000 5/88

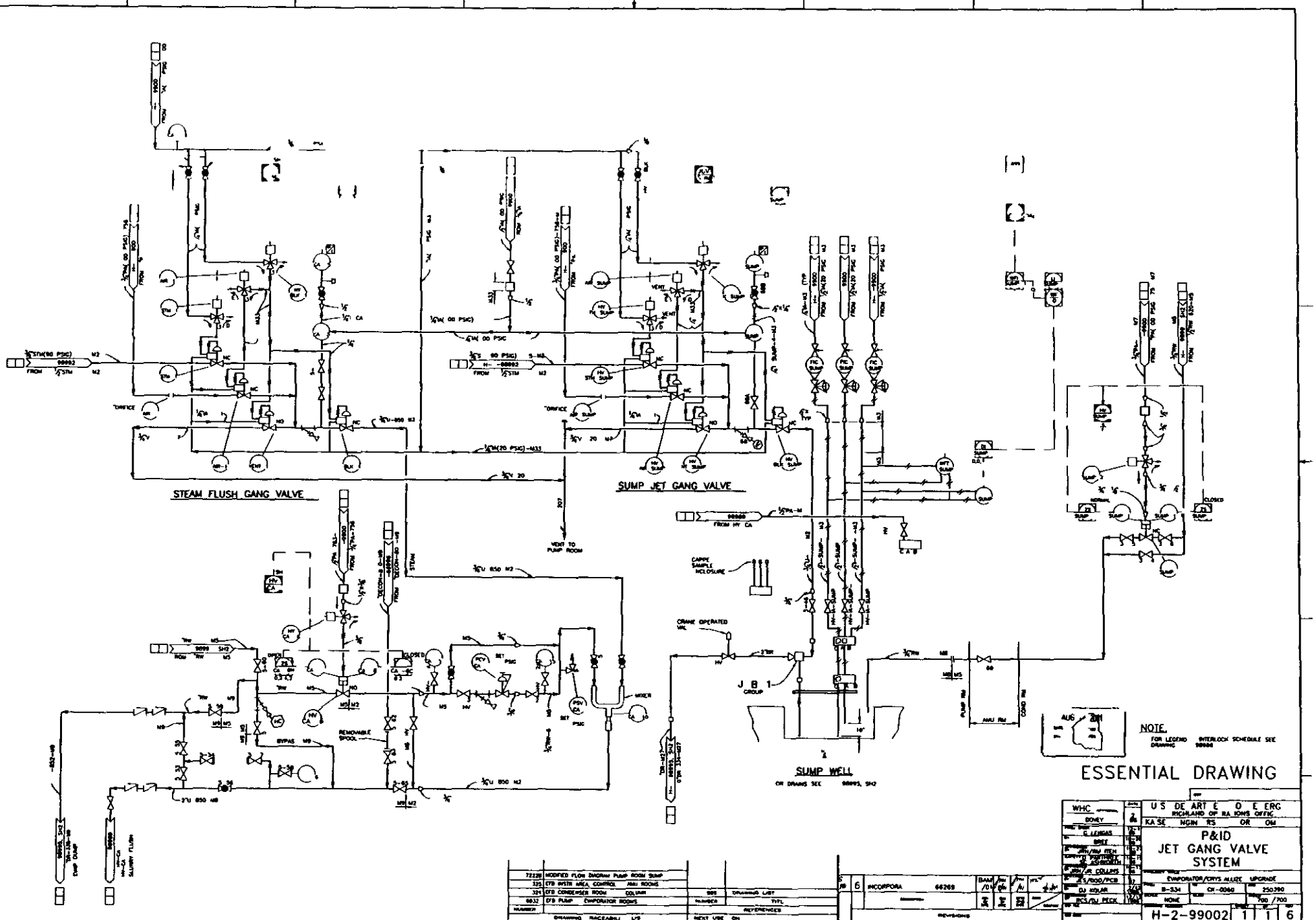


ESSENTIAL DRAWING

P&ID
DRAIN
SYSTEM

H-2 98995 5


ESSENTIAL DRAWING
P&ID
VACUUM CONDENSER
SYSTEM
H-2-98999
12
GENERAL NOTES
EVAPORATOR ROOM
FOR FIELD VERIFICATION


STEAM FLUSH GANG VALVE
SUMP JET GANG VALVE
SUMP WELL
ESSENTIAL DRAWING
NOTE.
P&ID
JET GANG VALVE
SYSTEM
H-2-99002

S

ENGINEERING CHANGE NOTICE ESSENTIAL

Page 1 of 7

CPF 13A, 13B

1 ECN -- 647885 --
Proj ECN

2 ECN Category (mark one)	3 Originator s Name Organization MSIN and Telephone No	4 USQ Required?	5 Date
Supplemental [X] Direct Revision [ ] Change ECN [ ] Temporary [ ] Standby [ ] Supersedure [ ] Cancel/Void [ ]	TM GALIOTO 32230 S6 72 373 4894	[X] Yes [ ] No Lw-98-026	06 15 98
	6 Project Title/No /Work Order No PT CA1 5 UPDATE	7 Bldg /Sys /Fac No 242A/200E	8 Approval Designator NA
	9 Document Numbers Changed by this ECN (includes sheet no and rev) SEE BLOCK 13A	10 Related ECN No(s) NA	11 Related PO No NA

12a Modification Work	12b Work Package No	12c Modification Work Complete	12d Restored to Original Condition (Temp or Standby ECN only)
[X] Yes (fill out Blk 12b) [ ] No (NA Blks 12b 12c 12d)	EL 97 00531	Design Authority/Cog Engineer Signature & Date	NA Design Authority/Cog Engineer Signature & Date

13a Description of Change
H 2 99002 SH1 REV 5
SEE PAGE 4 THIS ECN

13b Design Baseline Document? [X] Yes [ ] No

14a Justification (mark one)

Criteria Change	[X]	Design Improvement	[ ]	Environmental	[ ]	Facility Deactivation	[ ]
As Found	[ ]	Facilitate Const	[ ]	Const Error/Omission	[ ]	Design Error/Omission	[ ]

14b Justification Details
The pressure transmitter is no longer used or required It is being physically removed from service The lines to and from the pressure transmitter will be capped

15 Distribution (include name MSIN and no of copies)

TM GALIOTO	S6 72*	RF WEIS	S6 71
NJ SULLIVAN	S6 72	RS WEBER	S6 71
JE GEARY	S6 71	* = ADVANCED COPY	
J ISDELL	S6 17*		
MW BOWMAN	S6 72		
DL FLYCKT	S6 71		

*WCC PLANNG S6-72

RELEASE STAMP
JUN 30 1998
DATE:
STA. 30
HANFORD RELEASE ID: 25

A 7900 013 2 (05/96) GEF095

ENGINEERING CHANGE NOTICE

1 ECN (use no from pg 1): 647885

16 Design Verification Required	17 Cost Impact				18 Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[X] Yes	Additional	[ ] $	Additional	[ ] $	Improvement	[ ]
[ ] No	Savings	[ ] $NA	Savings	[ ] $NA	Delay	[ ] NA

19 Change Impact Review Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13 Enter the affected document number in Block 20

SDD/DD	[ ]	Seism c/Stress Analysis	[ ]	Tank Calibration Manual	[ ]
Functional Design Criteria	[ ]	Stress/Design Report	[ ]	Health Phys cs Procedure	[ ]
Operating Specification	[ ]	Interface Control Drawing	[ ]	Spares Multiple Unit Listing	[ ]
Cr ticality Spec f cation	[ ]	Calibration Procedure	[ ]	Test Procedures/Specif cation	[ ]
Conceptual Design Report	[ ]	Installation Procedure	[ ]	Component Inde	[X]
Equipment Spec.	[ ]	Mainte ance Procedure	[ ]	ASME Coded Item	[ ]
Const Spec	[ ]	Engineering Procedure	[ ]	Human Factor Consideration	[ ]
Procurement Spec	[ ]	Operating Instruction	[ ]	Computer Software	[ ]
Vendor Information	[ ]	Operating Procedure	[X]	Electric Circu t Schedule	[ ]
OM Manual	[ ]	Operat onal Safety Requi ement	[ ]	ICRS Procedure	[ ]
FSAR/SAR	[ ]	IEFD Drawing	[ ]	Process Co trol Manual/Plan	[ ]
Safety Equ pment List	[ ]	Cell Arrangement D awing	[ ]	P ocess Flow Chart	[ ]
Radiation Work Permit	[ ]	Essential Mate ial Specification	[ ]	Pu chase Requisition	[ ]
Environmental Impact Statement	[ ]	Fac Proc Samp Schedule	[ ]	Tickle File	[ ]
Environmental Report	[ ]	Inspection Pla	[ ]	None	[ ]
E vironmental Permit	[ ]	Inventory Adjustment Request	[ ]		[ ]

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

Document Number/Revision	Document Number/Revision	Document Number Revision
TO-6000-010		
EE-01553		

21 Approvals

	Signature	Date		Signature	Date
Design Authority TM GALIOTO	JM Galioto	6/15/98	Design Agent	M. DeHart	6/15/98
Cog Eng	JM Galioto	6/15/98	PE		
Cog Mgr	[signature]	6-30 98	QA		
QA			Safety		
Safety			Design		
Environ			Environ		
Informal Review	[signature]	6 30-98	Other		

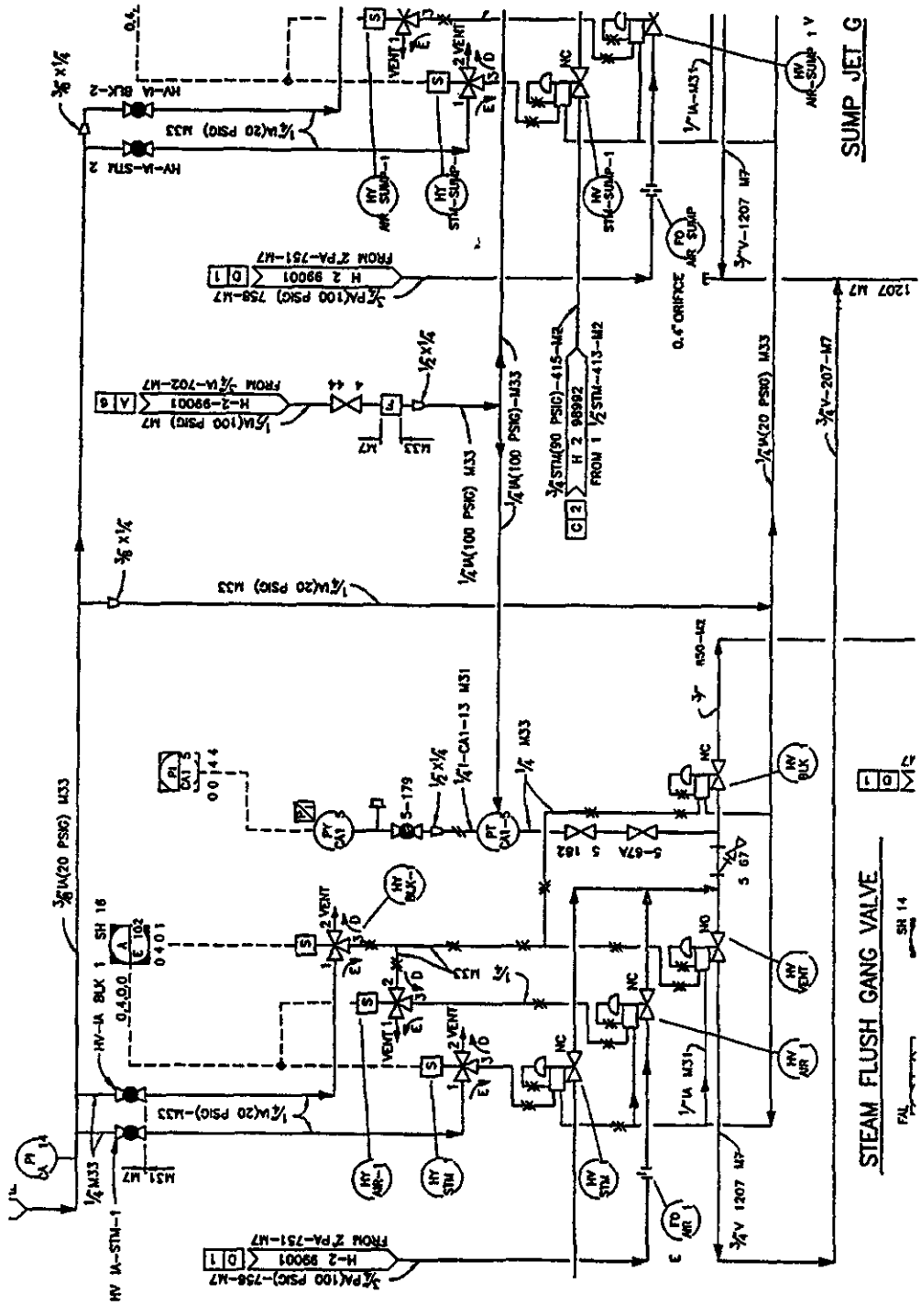
DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

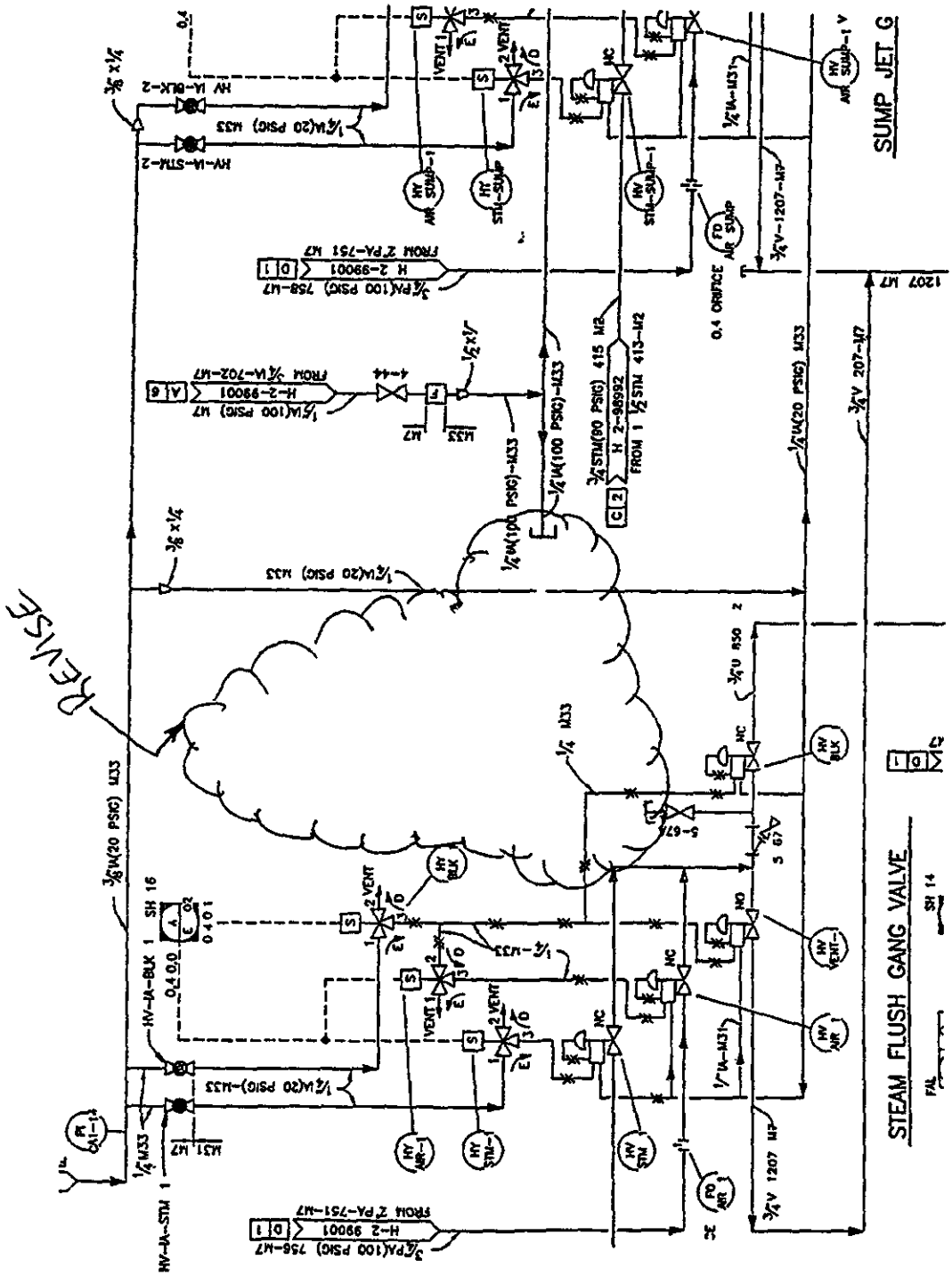
H-2-99002 Sh1 Rev5

WAS



H-2-99002 Sh1 Rev5

IS



Identification Number LW 98 025	USQ EVALUATION	Page 1 of 3

Title PT CA1 5 Modification

Facility 242 A Evaporator

ECN No 647885 PCA No

Work Pkg No EL 97 00531 Other (Specify)

TITLE PT-CA1 5 Modification

Description of the proposed activity/reportable occurrence or PIAB
The pressure transmitter PT CA1 5 is no longer used or required for process operations This instrument was the pressure transmitter for the steam flush of the slurry line and is not working and will be removed The lines to the pressure transmitter will then be capped

Introduction The pressure transmitter was removed for calibration and unable to be calibrated or repaired It was put into service then and not available for use This pressure transmitter will be removed and have the lines leading to it capped The pressure switch and associated equipment will be removed as well The 242A authorization basis does not describe the details of the pressure transmitters nor does it contain any accidents pertaining to the transmitters

Scope This USQ document analyzes the impact of removing the PT CA1 5 pressure transmitter and its associated equipment

Authorization basis The Authorization Basis for the 242-A Evaporator is the *242-A Evaporator Safety Analysis Report* HNF SD WM SAR 023 Rev 3 (SAR) The pressure transmitter is included in Table 5 4 which lists the applications of instrument air at the Evaporator This is the only discussion of the steam flush contained with the SAR

Steam supply and distribution are discussed in section 5 4 5 of the SAR Steam flushing is mentioned but flushing of the slurry line is not specified This section further states that Steam supply is not a Safety Class/Safety Significant system nor is it required to mitigate environmental releases

Compressed air is discussed in Section 5 4 4 of the SAR This section states that Compressed air is not a Safety Class or Safety Significant system nor is it required to mitigate environmental releases

The slurry system is described is section 6 4 1 2 Slurry line flushing is discussed in section 6 4 1 2 9 but only includes flushing with water or a chemical solution from the decontamination header Flushing using steam is not mentioned

Conclusion No DOE approval is necessary This change may be made at contractor discretion

Identification Number LW 98 025	USQ EVALUATION	Page 2 of 3

Title PT CA1 5 Modification

References None outside the Authorization Basis

1 Does the PROPOSED CHANGE test experiment or DISCOVERY increase the probability of occurrence of an accident previously evaluated in the AUTHORIZATION BASIS documentation?
[X] No [ ] Yes/Maybe

BASIS Accident analysis is contained in Section 9 3 of the SAR There are no accidents associated with the pressure transmitters or slurry line flushing at the 242A Evaporator Therefore the proposed change does not increase the probability of an accident previously evaluated in the Authorization basis document

2 Does the PROPOSED CHANGE test experiment or DISCOVERY increase the consequences of an accident previously evaluated in the AUTHORIZATION BASIS documentation?
[X] No [ ] Yes/Maybe

BASIS Accident analysis is contained in Section 9 3 of the SAR There are no accidents associated with the pressure transmitters or slurry line flushing at the 242A Evaporator Therefore the proposed change does not increase the consequences of an accident previously evaluated in the Authorization basis document

3 Does the PROPOSED CHANGE test experiment or DISCOVERY increase the probability of occurrence of a malfunction of EQUIPMENT IMPORTANT TO SAFETY (ITS EQUIPMENT) previously evaluated in the AUTHORIZATION BASIS documentation?
[X] No [ ] Yes/Maybe

BASIS The Preliminary Hazards Assessment is described in Section 9 2 of the SAR and summarized in Tables 9 4 through 9 8 None of these scenarios rely on slurry line steam flushing or instrumentation associated with steam flushing Therefore the proposed change does not increase the probability of a malfunction of ITS equipment as previously evaluated in the Authorization Basis

4 Does the PROPOSED CHANGE test experiment or DISCOVERY increase the consequences of a malfunction of ITS EQUIPMENT previously evaluated in the AUTHORIZATION BASIS documentation?
[X] No [ ] Yes/Maybe

BASIS The Preliminary Hazards Assessment is described in Section 9 2 of the SAR and summarized in Tables 9 4 through 9 8 None of these scenarios rely on slurry line steam flushing or instrumentation associated with steam flushing Therefore the proposed change will have no effect on the consequences of an ITS equipment malfunction

5 Does the PROPOSED CHANGE test experiment or DISCOVERY create the possibility of an accident of a different type than any previously evaluated in the AUTHORIZATION BASIS documentation?
[X] No [ ] Yes/Maybe

BASIS Steam flushing of the slurry line has not been performed in the recent past and it is unlikely to be required in the future As previously stated neither the steam system nor the compressed air system are required for safety or environmental purposes As the pressure transmitter is an air operated instrument on a steam line removal of this instrument cannot create a new type of accident but rather will decrease the potential for operational upset if the instrument were to malfunction during use

Identification Number LW 98 025	USQ EVALUATION	Page 3 of 3
Title PT CA1 5 Modification		

6 Does the PROPOSED CHANGE test experiment or DISCOVERY create the possibility of a malfunction of ITS EQUIPMENT of a different type than any previously evaluated in the AUTHORIZATION BASIS documentation?
[X] No [] Yes/Maybe

BASIS Steam flushing of the slurry line has not be performed in the recent past and it is unlikely to be required in the future As previously stated neither the steam system nor the compressed air system are required for safety or environmental purposes As the pressure transmitter is an air operated instrument on a steam line removal of this instrument cannot create a new type of ITS equipment malfunction It will however decrease the potential for operational upset if the instrument were to malfunction during use

7 Does the PROPOSED CHANGE test experiment or DISCOVERY reduce the margin of safety as defined in the basis for any Technical Safety Requirement?
[X] No [] Yes/Maybe

BASIS Operational Safety Requirements (OSRs) and their bases sections are specified in Chapter 11 of the SAR The proposed change will not decrease the margin of safety for any OSR as described in its basis There are no OSRs associated with the pressure transmitter or slurry line flushing as defined in the Authorization basis document

8 Does the PROPOSED CHANGE test experiment or DISCOVERY require a new or revised Technical Safety Requirement?
[X] No [] Yes/Maybe

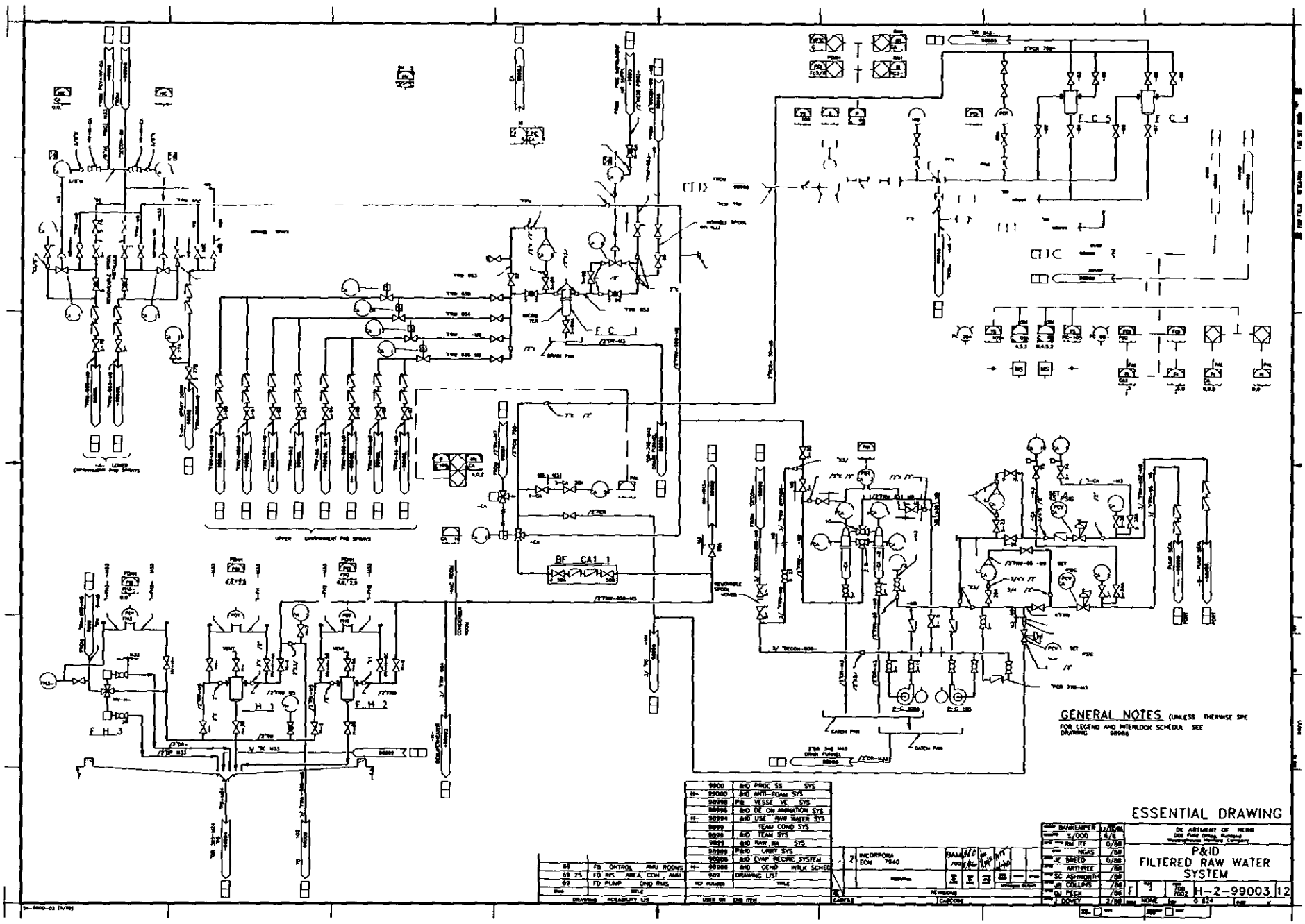
BASIS The removal of the pressure transmitter will have no effect on the OSRs for the 242A Evaporator

USQE #1 TM GALIOTO (Print Name)

Signature Date 6-24-98

USQE #2 MD GUTHRIE (Print Name)

Signature Date 6/24/98


GENERAL NOTES (UNLESS THERWISE SPE
FOR LEGEND AND INTERLOCK SCHEDUL SEE
DRAWING 99985
ESSENTIAL DRAWING
P&ID
FILTERED RAW WATER
SYSTEM
H-2-99003 12

Hanford Facility RCRA Permit Modification Notification
Part III Chapter 5 and Attachment 35
242 A Evaporator

Replacement Section

Index

APPENDIX 4A

ENGINEERING DRAWINGS

ENGINEERING DRAWINGS

The drawings in Table 4A 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 to demonstrate the adequacy of the design of the tank systems An update to these drawings will be provided annually to the Washington State Department of Ecology

Table 4A 1 Process and Instrumentation Diagrams

System	Drawing Number	Outstanding ECNs	Drawing Title
Vapor Liquid Separator	H 2 98988 Sh 1 Rev 7	None	P & ID Evap Recirc System
Reboiler/Recirculation Line	H 2 98988 Sh 2 Rev 5	None	P & ID Evap Recirc System
Slurry System	H 2 98989 Sh 1 Rev 11	ECN 664551 ECN 664553	P & ID Slurry System
Condensate Collection Tank	H 2 98990 Sh 1 Rev 10	None	P & ID Process Condensate System
Secondary Containment Drain System	H 2 98995 Sh 1 Rev 12	None	P & ID Drain System
Secondary Containment Drain System	H 2 98995 Sh 2 Rev 5	None	P & ID Drain System
Condensers	H 2 98999 Sh 1 Rev 12	None	P & ID Vacuum Condenser System
Pump Room Sump	H 2 99002 Sh 1 Rev 6	ECN 647885	P & ID Jet Gang Valve System
Condensate Recycle System	H 2 99003 Sh 1 Rev 12	None	P & ID Filtered Raw Water System

ECN engineering change notice
P & ID piping and instrumentation diagram

The drawings in Table 4A 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 ECNs that affect the secondary containment systems will be submitted to the Washington State Department of Ecology as a Class 1 2 or 3 permit modification as required by WAC 173 303 830

Table 4A 2 Drawing of 242 A Evaporator Secondary Containment Systems

System	Drawing Number	Outstanding ECNs	Drawing Title
242 A Building	H 2 69277 Sh 1 Rev 2	None	Structural Foundation Plan Sections & General Notes Areas 1 & 2
	H 2 69278 Sh 1 Rev 3	None	Structural Foundation Elevations & Details Areas 1 & 2
	H 2 69279 Sh 1 Rev 3	None	Structural First Floor Plan & AMU Areas 1 & 2
Pump Room Sump Drainage	H 2 69352 Sh 1 Rev 4	ECN 121216 ECN 121238 ECN 194242 ECN 610629 ECN 620353	Sections Process Waste Drainage
242 A Building Drainage	H 2 69354 Sh 1 Rev 4	ECN 194242 ECN 610629 ECN 620353	Plan Process Waste Drainage
Pump Room Sump	H 2 69369 Sh 1 Rev 1	None	Pump Room Sump Assembly & Details

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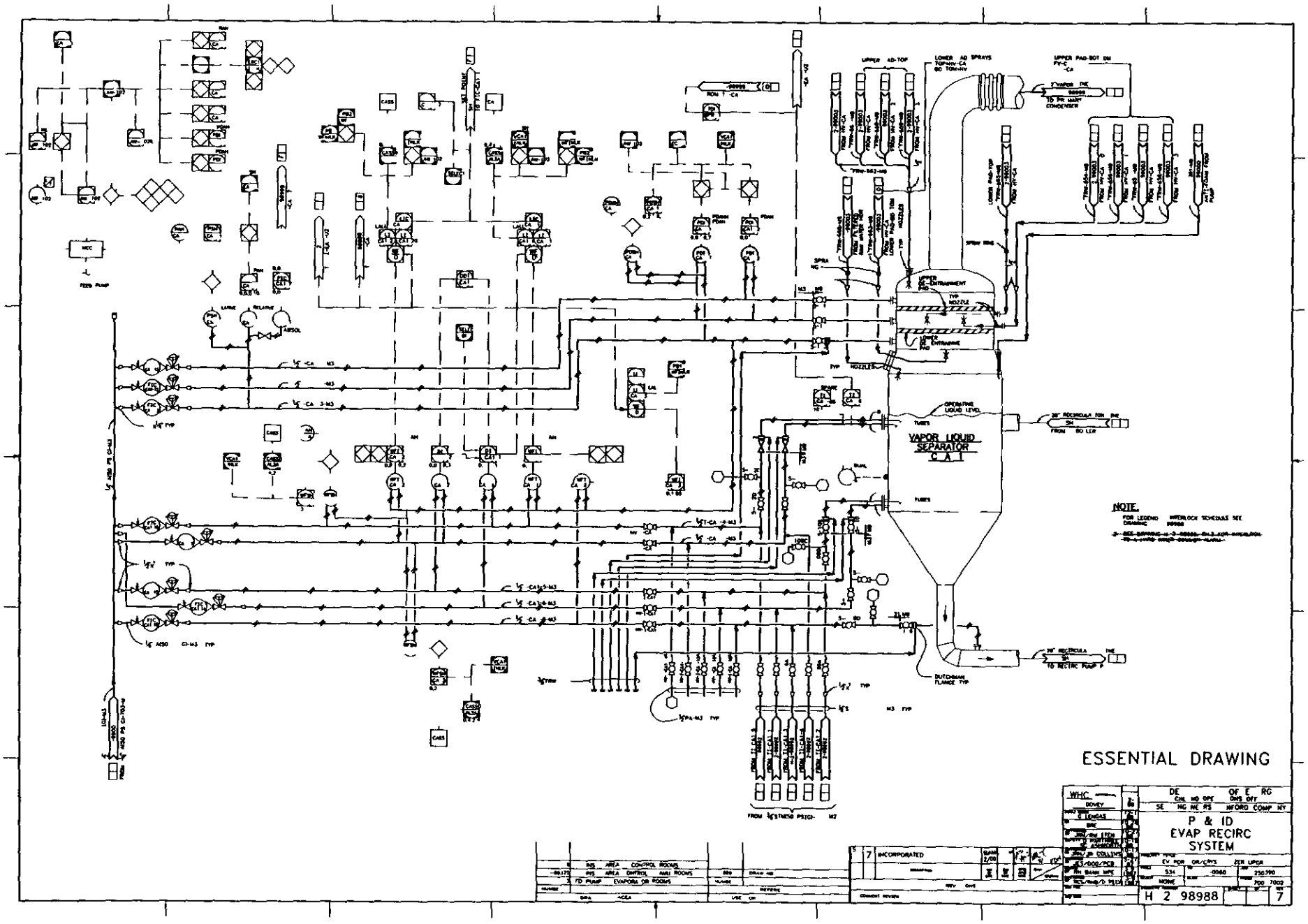
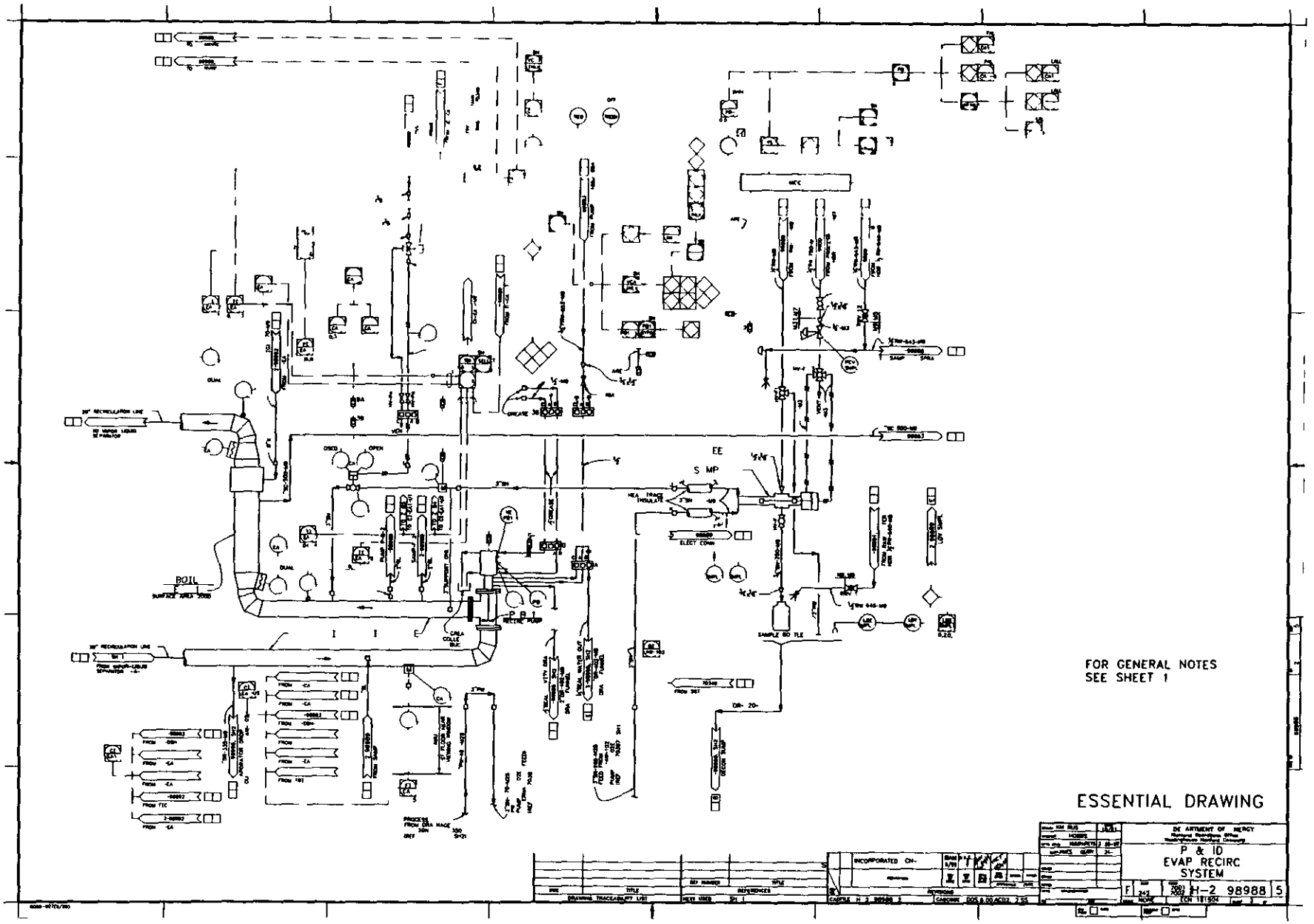
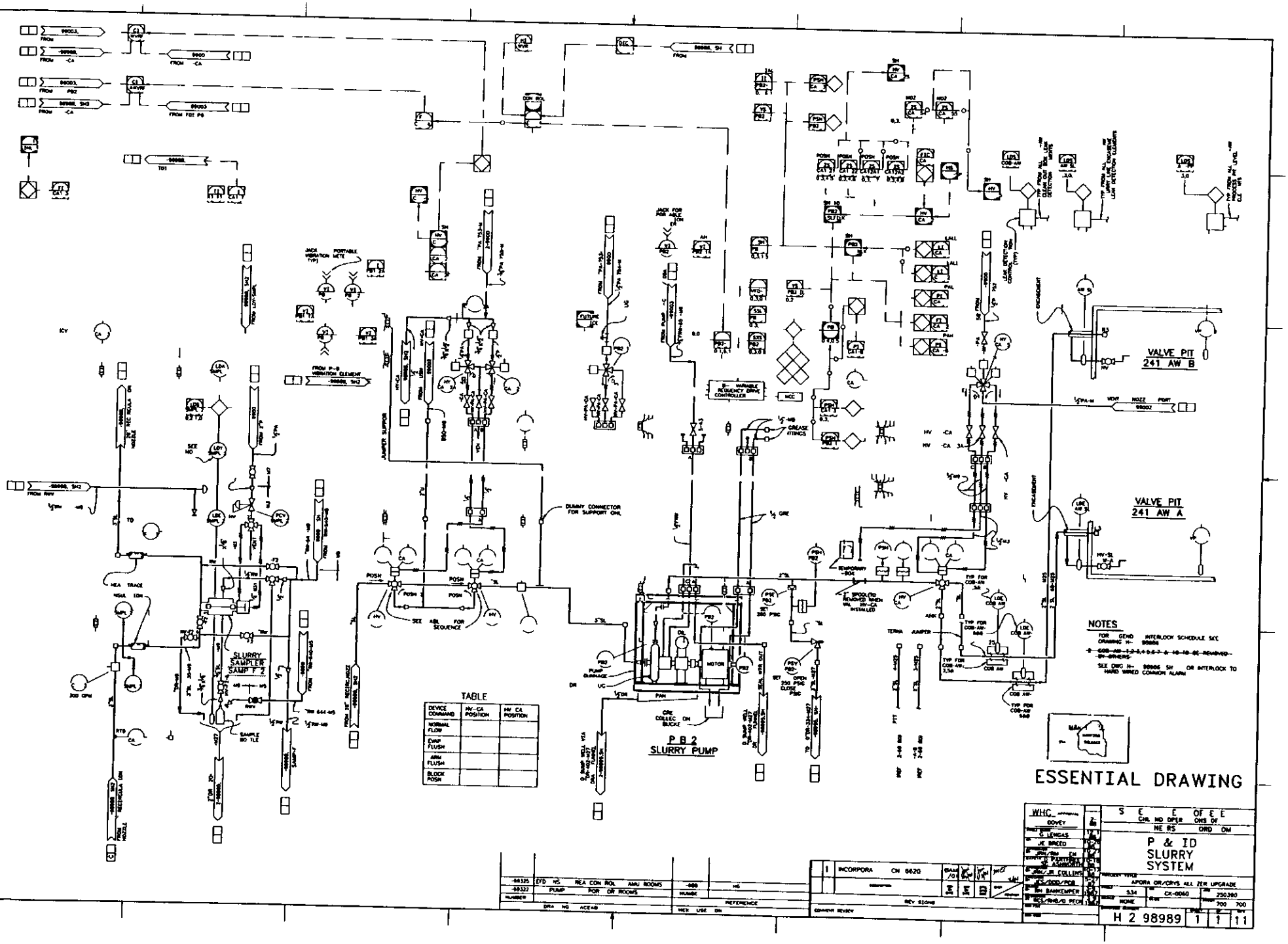

VAPOR LIQUID SEPARATOR
C A T
NOTE.
ESSENTIAL DRAWING
P & ID
EVAP RECIRC
SYSTEM
H 2 98988


BOIL
FOR GENERAL NOTES
SEE SHEET 1
ESSENTIAL DRAWING
P & ID
EVAP RECIRC
SYSTEM
98988


VALVE PIT
241 AW B
VALVE PIT
241 AW A
P B 2
SLURRY PUMP
SLURRY SAMPLER SAMP P 2
TABLE
DEVICE COMMAND
HV-CA POSITION
HV CA POSITION
NORMAL FLOW
EVAP FLUSH
ARM FLUSH
BLOCK POSH
NOTES
ESSENTIAL DRAWING
P & ID
SLURRY
SYSTEM
H 2 98989

S

ENGINEERING CHANGE NOTICE

ESSENTIAL

CPF 13A & B

Page 1 of 17

1 ECN 664551

Proj ECN

2 ECN Category (mark one)	3 Originator's Name Organization MSIN and Telephone No	4 USQ Required?	5 Date
Supplemental ☒	Danny P Mendoza ARES Corporation 946-8946	☒ Yes ☐ No	08/10/01
Direct Revision ☐			
Change ECN ☐			
Temporary ☐			
Standby ☐			
Supersedure ☐			
Cancel/Void ☐			

6 Project Title/No./Work Order No	7 Bldg /Sys /Fac No	8 Approval Designator
242-A Evaporator Life Extension Upgrades	242-A/A11	T Q
9 Document Numbers Changed by this ECN (includes sheet no and rev)	**10 Related ECN No(s)**	**11 Related PO No**
See Block 13a	664552	N/A

12a Modification Work	12b Work Package No	12c Modification Work Completed	12d Restored to Original Condition (Temp or Standby ECNs only)
☒ Yes (fill out Blk 12b) ☐ No (NA Blks 12b 12c, 12d)	EL-01-00452	Design Authority/Cog Engineer Signature & Date	N/A Design Authority/Cog Engineer Signature & Date

13a Description of Change

13b Design Baseline Document? ☒ Yes ☐ No

USQ # LW-01-032

See page 3 of this ECN for a listing of the affected drawings and a description of the change

ECN 664552 will update WHC-SD-534-SWD-001 to show the new multiplexer addresses assigned for multivariable meter input (flow density and transmitter fault)

Page 15 of this ECN has been included for information only It is not intended that this information be included on any drawing It is an Instrument Datasheet which details the design parameters that the multivariable instrument to be installed at the 242-A Evaporator for density and volumetric flow readings meet or exceed It is included in order to document the design information associated with the selection of the multivariable instrument

14a Justification (mark one)	14b Justification Details
Criteria Change ☐	The existing magnetic flow element FE CA1-3 and flow transmitter FT-CA1-3 are being replaced with a more accurate multivariable sensor and transmitter This change is required in order to support the 242-A Evaporator Life Extension activities
Design Improvement ☒	
Environmental ☐	
Facility Deactivation ☐	
As-Found ☐	
Facilitate Const ☐	
Const Error/Omission ☐	
Design Error/Omission ☐	

15 Distribution (include name MSIN and no of copies)

- Indicates Advance Copy

CD Skogley	S6-71	(1)	CM Towne	S6-74	(1)
EA McNamar	S6-72	(1)	WCC Planning	S6-71	(1)
DL Flyckt	S6-71	(1)	JL Foster	S6-71	(1)
NJ Sullivan	S6-72	(1)	JA Locklair	T3-06	(1)
MC Teats	S6-72	(1)	JB Benton	S6-72	(1)
RW Szelmeczka	S6-72	(1)			
JM Isdell	B4-39	(1)			
MW Bowman	S6-72	(1)			

RELEASE STAMP

SEP 05 2001

DATE:

STA. 30

HANFORD RELEASE ID: 25

A 7900 013-2 (10/97)

A 7900-013-1

ENGINEERING CHANGE NOTICE

1 ECN (use no from pg 1): 664551

16 Design Verification Required	17 Cost Impact		18 Schedule Impact (days)
	ENGINEERING	CONSTRUCTION	
☒ Yes	Additional ☐ $ N/A	Additional ☐ $ N/A	Improvement ☐ N/A
☐ No	Savings ☐ $ N/A	Savings ☐ $ N/A	Delay ☐ N/A

19 Change Impact Review Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13 Enter the affected document number in Block 20

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

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

Document Number/Revision	Document Number/Revision	Document Number/Revision
	ARP-T-601-012	TO-600-010
	TO-600-030	
	TO-600-035	
	TO-650-140	

21 Approvals

Signature	Date	Signature	Date
Design Authority EA McNamar EA McNamar	8-23-01	Design Agent _____	
Cog Eng EA McNamar EA McNamar	8-23-01	PE _____	
Cog Mgr KJ Lueck KJ Lueck	8 29 01	QA _____	
QA MJ Warn MJ Warn	8/29/01	Safety _____	
Safety _____		Design _____	
Environ _____		Environ _____	
Other _____		Other _____	
Technical Rev ew Mac Te ts Mac Tests	8/29/01	_____	
_____		_____	
242 A Electrical DA Ma Towne C Mtowne	8/29/01	DEPARTMENT OF ENERGY	
_____		Signature or a Control Number that tracks the Approval Signature	
_____		_____	
_____		ADDITIONAL	
_____		_____	
_____		_____	
_____		_____	

Affected Drawings

H-2-99048 Sh 2 Rev 3 Show location of new transmitter UIT-CA1-3 along with parts callout on AMU plan drawing as shown on page 4 of this ECN

H-2-99048 Sh 9 Rev 2 Show UIT-CA1-3 parts callout/mounting details on section drawing FT-CA1-3 to be removed as shown on page 5 of this ECN

H-2-99059 Sh 2 Rev 5 Add interconnection diagram for UE/UIT-CA1-3 Delete interconnection diagram for FE/FT-CA1-3 as shown on page 6 of this ECN

H-2-99071 Sh 2 Rev 4 Show new power conduit P1312 from new JB 1230 to UIT-CA1-3 as shown on page 7 of this ECN Show reroute of power to FT-CA1-7 via P1313

H-2-99074 Sh 1 Rev 4 Show UE-CA1-3 location on plan and reference section for mounting details of junction box JB-UE-CA1-3 Route new conduit P2007 to JB-UE-CA1-3 for sensor cable connection as shown on page 8 of this ECN

H-2-99048 Sh 1 Rev 4 Add new mass flowmeter transmitter Coriolis sensor and junction box JB-UE-CA1-3 to parts list as shown on page 9 of this ECN

H-2-99087 Sh 7 Rev 5 Add new wire run and conduit for UIT-CA1-3 power supply and modify existing power supply wire run to FT-CA1-7 as shown on page 9 of this ECN

H-2-98986 Sh 3 Rev 2 Update MCS Identification Letter Table to include U for multivariable instrument as shown on page 9 of this ECN

H-2-99087 Sh 8 Rev 4 Add wire run details for new wire run 441 UIT-CA1-3 power supply as shown on page 10 of this ECN

H-2-99087 Sh 10 Rev 4 Assign new conduit and wire run numbers for UE-CA1-3 to UIT-CA1-3 sensor wire and UIT-CA1-3 to MUX cabinet signal cable as shown on page 10 of this ECN

H-2-99087 Sh 12 Rev 0 Update wire run 2162 and 2185 to show cables for old flowmeter as being spare as shown on page 11 of this ECN

H-2-85322 Sh 3 Rev 1 Update panel schedule loading values due to addition of UIT-CA1-3 as shown on page 12 of this ECN

H-2-90977 Sh 1 Rev 1 Jumper has been redesigned with a new mass flow and density sensor Replace existing design shown on this drawing (including material list and notes) with new design shown on page 13 of this ECN

H-2-99009 Sh 1 Rev 2 Correct jumper location drawing to reflect new jumper and multivariable meter design as shown on page 14 of this ECN

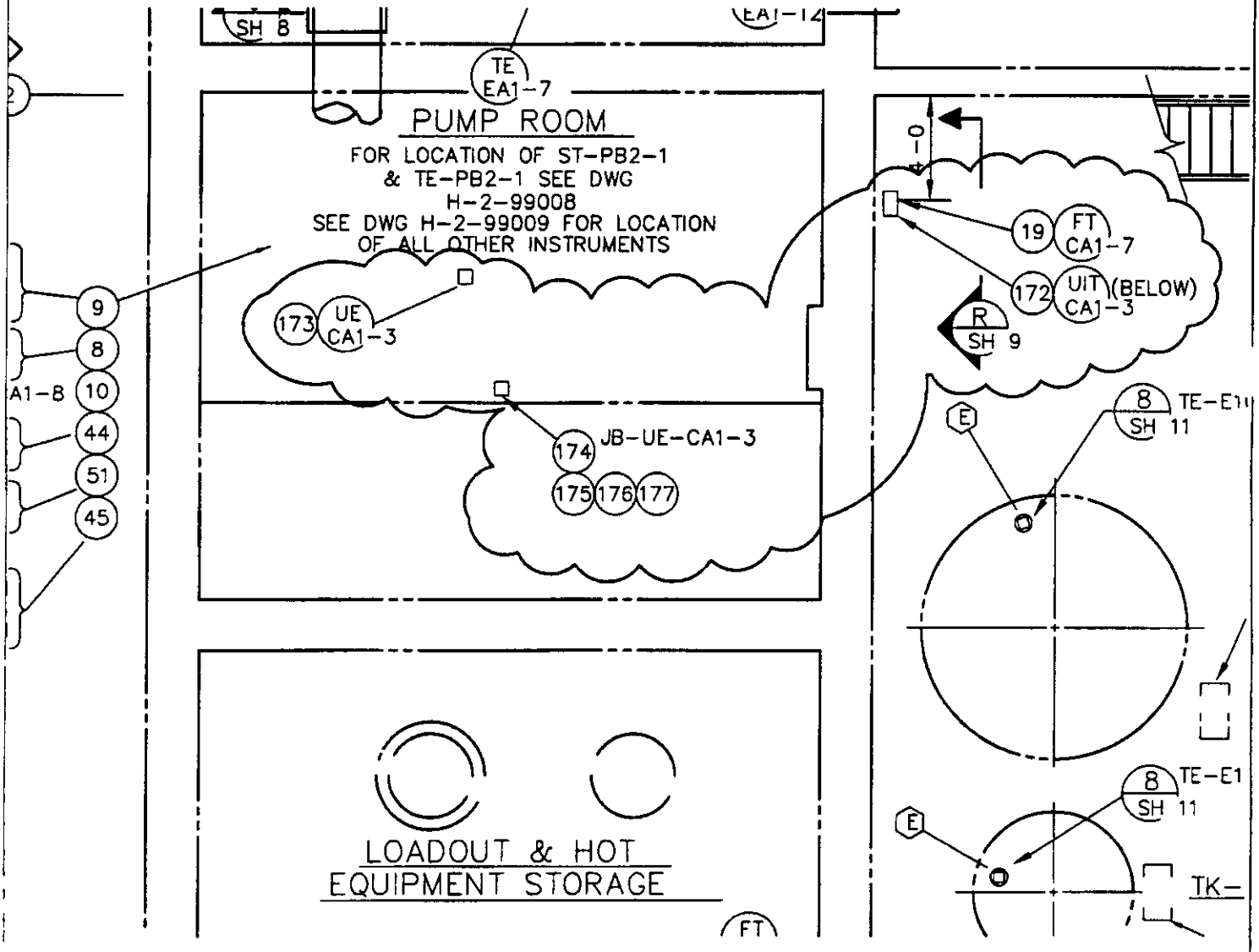
H-2-98989 Sh 1 Rev 11 Update P&ID to show FE/FT-CA1-3 changed to UE and UIT-CA1-3 along with new MCS tags as shown on page 16 of this ECN

H-2-99949 Sh 12 Rev 1 Update MCS logic diagram to reflect new PCM Multiplexer Board and Point addresses for FI-CA1-3 as shown on page 17 of this ECN

ARES CORPORATION	ENGINEERING CHANGE NOTICE SKETCH					
Ref Dwg	Sh	Rev	Prep red By	Checked By	ECN No	Page
H-2-99048	2	3	K HALE		664551	4

ZN C-D/6-7

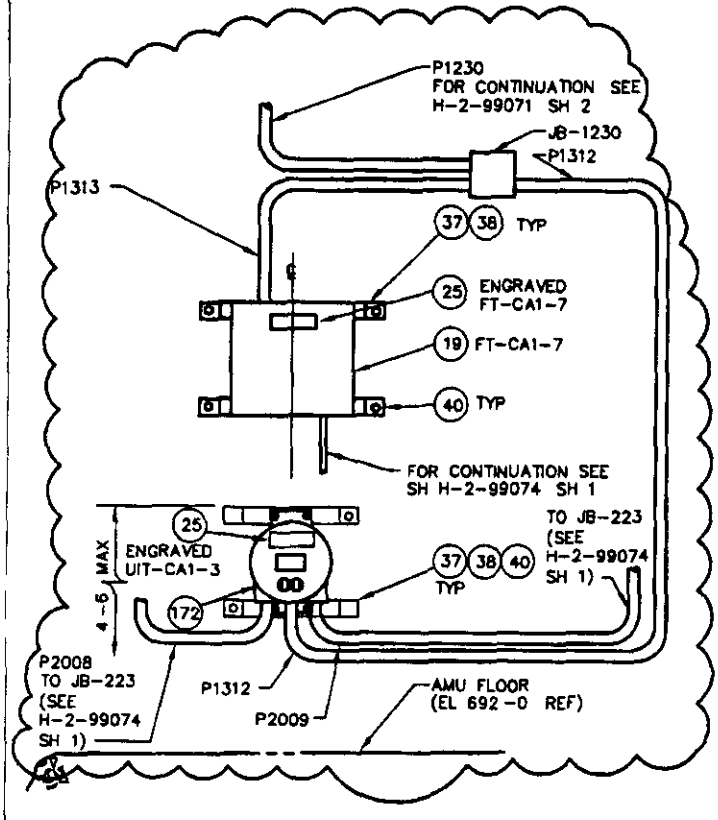
ADD NEW FLOW TRANSMITTER
(LOCATE BELOW EXST FLOW TRANSMITTER)



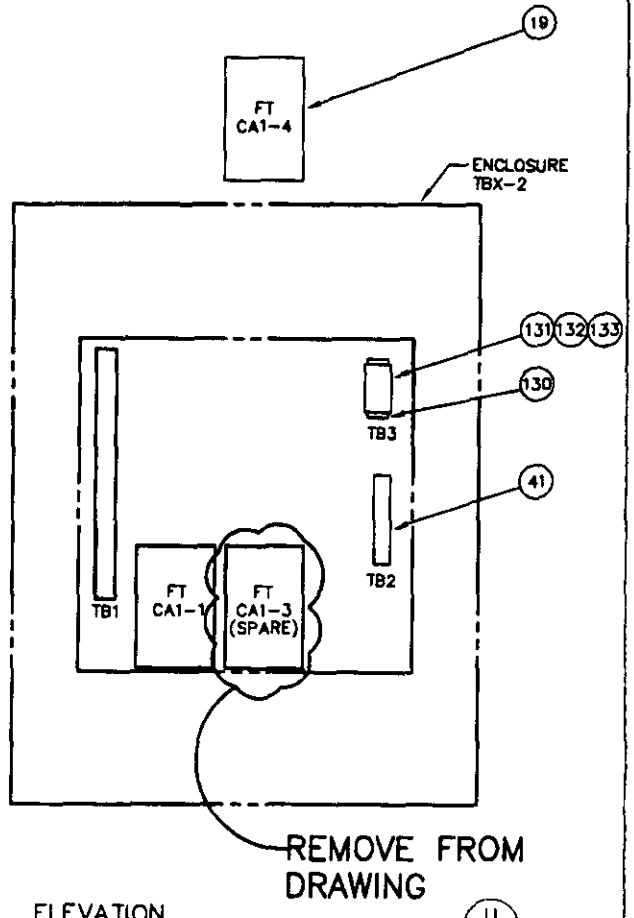
ARES CORPORATION	ENGINEERING CHANGE NOTICE SKETCH					
R f Dwg	Sh	Rev	Prepared By	Check d By	ECN N	Pag
H-2-99048	9	2	K HALE		664551	5

ZN D-E/3-4

ADD NEW FLOW TRANSMITTER AND NAMETAG (LOCATE NEW TRANSMITTER BELOW EXST FLOW TRANSMITTER) INTERCEPT EXST P1230 AS SHOWN
EXST FT-CA1-3 IS TO BE REMOVED CONDUCTORS TO BE SPARE



ELEVATION (R SH 2)
FLOW TRANSMITTER INSTALLATION
AMU ROOM
SCALE 1-1/2 = 1-0

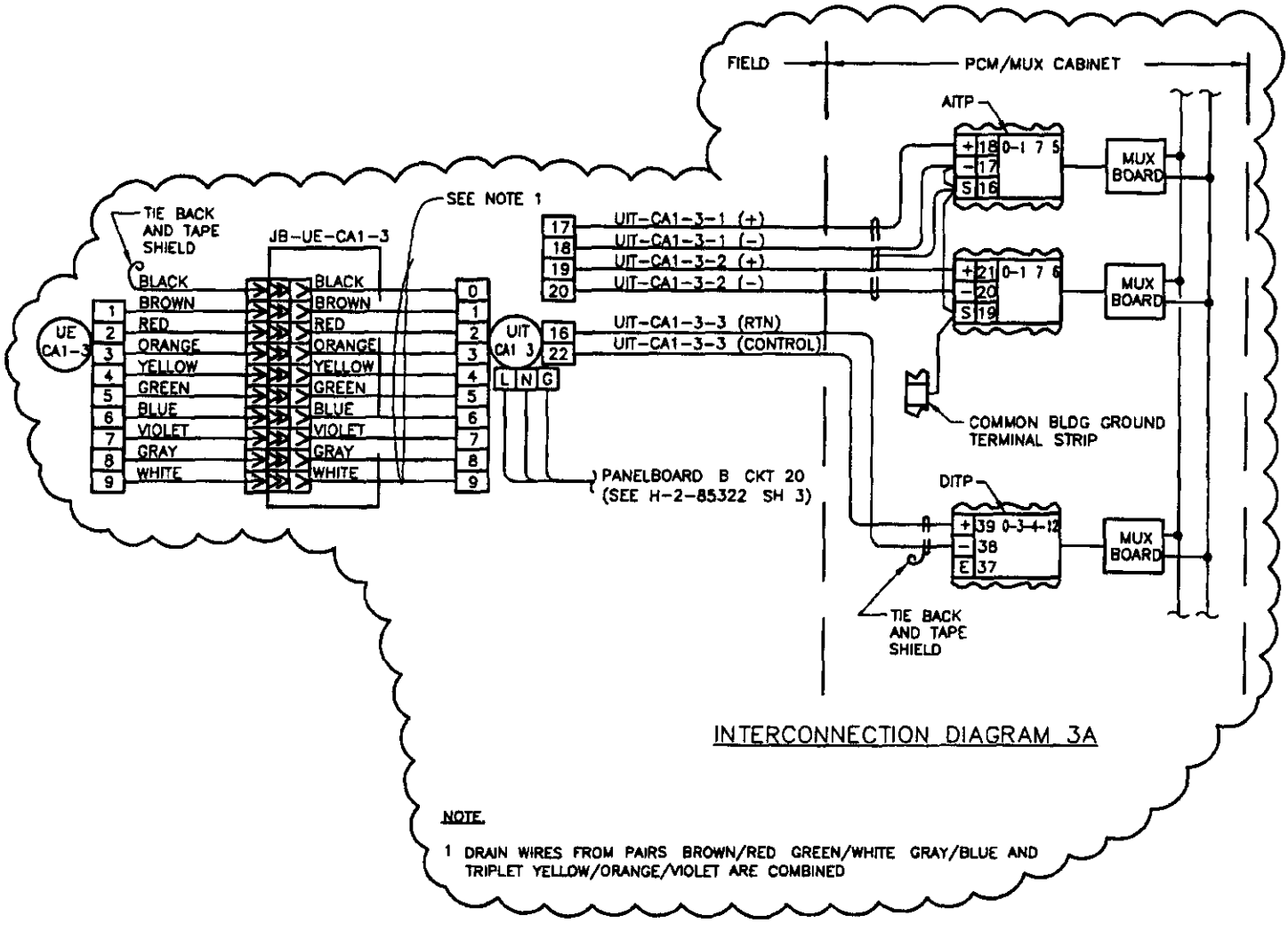


ELEVATION (U SH 3)
SHOWN WITH TBX-2 ENCLOSURE DOORS REMOVED
SCALE 1-1/2 = 1-0

ARES CORPORATION	ENGINEERING CHANGE NOTICE SKETCH					
Ref Dwg	Sh	Rev	Prep red By	Checked By	ECN N	P ge
H-2-99059	2	5	K HALE		664551	6

ZN C/5-8

REPLACE DIAGRAM 3A AS SHOWN



INTERCONNECTION DIAGRAM 3A

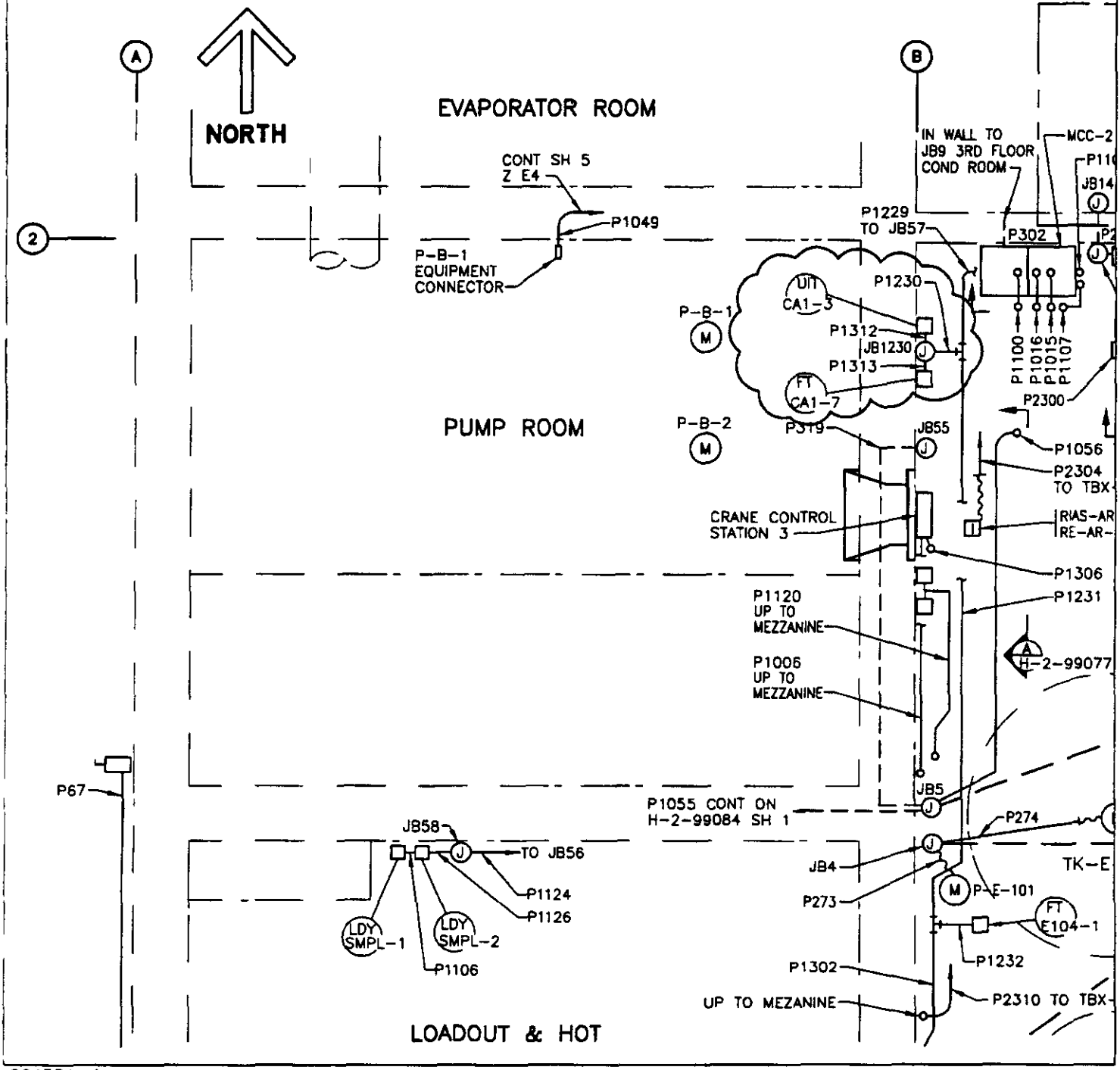
NOTE.

1 DRAIN WIRES FROM PAIRS BROWN/RED GREEN/WHITE GRAY/BLUE AND TRIPLET YELLOW/ORANGE/VIOLET ARE COMBINED

ARES CORPORATION	ENGINEERING CHANGE NOTICE SKETCH					
Ref Dwg	Sh	Rev	Prepared By	Checked By	ECN N	Pag
H-2-99071	2	4	K HALE		664551	7

ZN E/6

INSTALL/ADD NEW FLOWMETER
AND ASSOCIATED ELECTRICAL
EQUIPMENT



ARES CORPORATION — Applied Research & Engineering Solutions

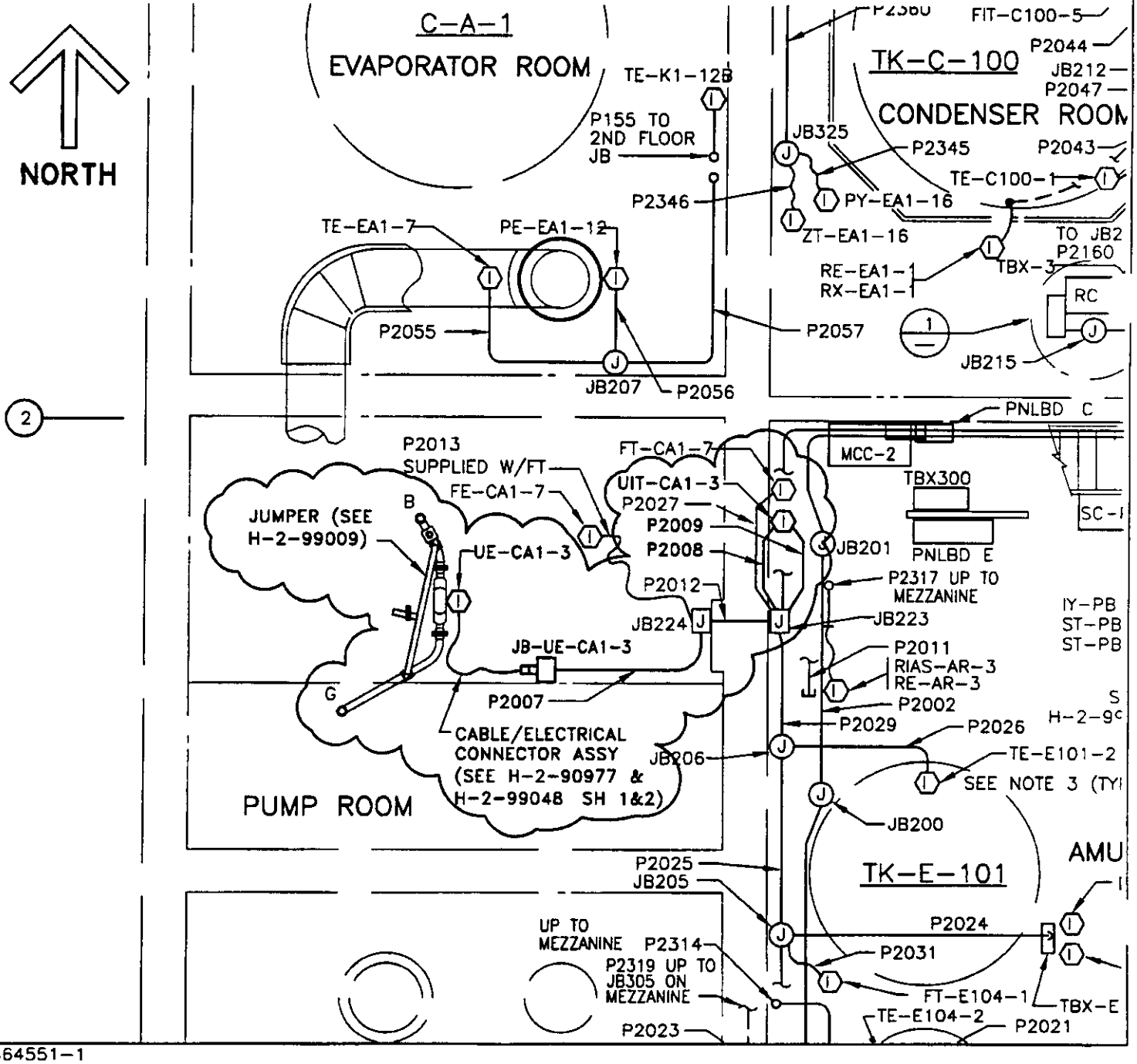
ENGINEERING CHANGE NOTICE SKETCH

Ref Dwg	Sh	Rev	Prepared By	Checked By	ECN No	Page
H-2-99074	1	4	K HALE		664551	8

ZN C-D/6-7

NOTE TO INSTALLER (DO NOT INCORPORATE ON DRAWING)

INSTALL/ADD NEW FLOWMETER AND ASSOCIATED ELECTRICAL EQUIPMENT MOUNT JUNCTION BOX JB-UE-CA1-3 ON PUMP ROOM SOUTH SHELF WALL 4 -6 MAXIMUM ABOVE FINISHED FLOOR AND NEAR TO JUMPER G-B NEW FLOW MASS DENSITY METER UE-CA1-3 USE RIGID OR IMC TYPE CONDUIT AND FITTINGS APPROPRIATE FOR WET LOCATION INSTALLATION I E -MYERS HUB/GASKETED LB FITTINGS



ARES CORPORATION

ENGINEERING CHANGE NOTICE SKETCH

R f Dwg	Sh	Rev	Prep red By	Checked By	ECN No	P ge
SEE BELOW	–	–	K HALE		664551	9

H-2-99048, SH 1, REV 4, ZONE E-F/6-7

ADD THE FOLLOWING TO THE PARTS LIST

QTY	PN	DESCRIPTION	MATL/REF
1	172	MICROMOTION MASS FLOW AND DENSITY TRANSMITTER	RFT9739D4SUA
1	173	MICROMOTION ELITE MASS FLOW AND DENSITY SENSOR	CMF300M355NRJUEZZZ
1	174	BULKHEAD SHELL	AMPHENOL PTBE-16-99-PS
1	175	CONNECTOR SOCKET	SEE P/N 19 (H-2-90977-1)
1	176	CONNECTOR PLUG	SEE P/N 18 (H-2-90977-1)
1	177	JUNCTION BOX	HOFFMAN A-8064NFSS

H-2-99087, SH 7, REV 5, ZONE D/2-8

UPDATE THE WIRE RUN SCHEDULE TO REVISE WIRE RUN 364 AS FOLLOWS

WIRE RUN NO	NO OF WIRES	SIZE OF WIRES	TYPE OF WIRE	FROM	VIA	TO	WIRE NUMBERS
364	3	12	1	TEE	P1230 JB1230 P1313	FT-CA1-7	B20H B20N GND

UPDATE THE CONDUIT SCHEDULE TO ADD NEW WIRE RUN FOR DENSITY TRANSMITTER POWER

CND NO	CND SIZE	WIRE RUN NUMBERS
P1312	3/4	441
P1313	3/4	364

H-2-98986, SH 3, REV 2, ZONE E-/1-3

ADD MCS I D LETTER U

MCS IDENTIFICATION LETTERS					
FIRST LETTER			SUCCEEDING LETTERS		
	MEASURED OR INITIATIZING FUNCTION	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
C	CALCULATED-◊			CONTROLLER	
D	DENSITY (MASS) SPECIFIC GRAVITY	DETECTION DIFFERENCIAL			
T	TEMPERATURE				
U	MULTIVARIABLE				
V	VIBRATION				
W	WEIGHT				
X		FAILURE			
Y	EVENT STATE			RELAY	
Z	POSITION				

ARES CORPORATION

ENGINEERING CHANGE NOTICE SKETCH

Ref Dwg	Sh	Rev	Prepared By	Checked By	ECN N	Pag
SEE BELOW	–	–	K HALE		664551	10

H-2-99087, SH 8, REV 4, ZONE C/4-8

UPDATE THE WIRE RUN SCHEDULE TO REVISE WIRE RUN 441 AS FOLLOWS

WIRE RUN NO	NO OF WIRES	SIZE OF WIRES	TYPE OF WIRE	FROM	VIA	TO	WIRE NUMBERS
441	3	14	1	JB1230	P1312	UIT-CA1-3	B20H B20N GND

H-2-99087, SH 10, REV 4, ZONE D-F/2-8

UPDATE THE WIRE RUN SCHEDULE TO ADD AS FOLLOWS

WIRE RUN NO	NO OF WIRES	SIZE OF WIRES	TYPE OF WIRE	FROM	VIA	TO	WIRE NUMBERS
2002	1	–	17	UE-CA1-3	JB-UE-CA1-3 P2007 JB224 P2012 JB223 P2008	UIT-CA1-3	VENDOR SUPPLIED CABLE
2003	3	18	2	MCS PCM 0 MUX 1	SFWW DCWW-2 PB150B PB150A P2028 JB223 P2009	UIT-CA1-3	UIT-CA1-3-1(+) UIT-CA1-3-1(-) SHLD UIT-CA1-3-2(+) UIT-CA1-3-2(-) SHLD UIT-CA1-3-3 (RTN) UIT-CA1-3-3 (CONTROL) SHLD

UPDATE CONDUIT SCHEDULE TO ADD AND REVISE WIRE RUN AS FOLLOWS

CND NO	CND SIZE	WIRE RUN NUMBERS
P2007	2	2002
P2008	3/4	2002
P2009	1/2	2003
P2012	2	2020 2002
P2028	1-1/2	2013 2014 2015 2016 2017 2018 2019 2 – 2045 2003

ARES CORPORATION — Applied Research & Engineering Division

ENGINEERING CHANGE NOTICE SKETCH

R f Dwg	Sh	Rev	Prepared By	Checked By	ECN No	Pag
H-2-99087	12	0	K HALE		664551	11

ZONE D&F/3-8

UPDATE THE WIRE RUN SCHEDULE TO REVISE WIRE RUNS 2182 AND 2185 AS FOLLOWS

WIRE RUN NO	NO OF WIRES	SIZE OF WIRES	TYPE OF WIRE	FROM	VIA	TO	WIRE NUMBERS
2182	1	-	17	CONN 7A	P2227	TBX 2	SPARE
2185	5	18	2	MCS PCM 0 MUX 1	DCWW P2231	TBX-2	FT-CA1-1( ) (-) SH FT CA1-4( ) (-) SH ZT-CA1 3(+) ( ) SH 2 SPARE

ARES CORPO ATION — Applied Research & Engineering Sciences

ENGINEERING CHANGE NOTICE SKETCH

Ref Dwg	Sh	Rev	Prep red By	Check d By	ECN N	Page
H-2-85322	3	1	K HALE		664551	12

REVISE PANELBOARD B CIRCUIT 20 TO
ADD NEW POWER LOAD OF 15 VOLT-AMPS
FOR FLOW MASS DENSITY
METER/TRANSMITTER UIT-CA1-3

SCRIPTION	NO	NO		NO	NO	LOAD DESCRIPTION	PH A	PH B	PH C	JC Empl NUMBER	REMARKS
E F G		1	20	2		RCPT RM 1 3 4 & EXH FAN	1080				
& INST ENCL		3	20	4		RECEPTACLES RM 1 & 3		360			
C		5	20	6		RCPT RM 3 4 13 & 15			720		
A & C		7	20	8		RECEPTACLES RM 5 13 & 1	1600				
C		9	20	10		RCPT RM 8 8 9 & 12		900			
P-RC3-2		11	20	12		SEAL WATER PUMP P-C 105 (1/2 HP)			1130		
& MTR K1 7 1		13	20	14		RCPT RM 2 4 9 & 18	720				
& MTR K2-7-1		15	20	16		RCPT RM 2 6 11 12 & 16		900			
PT & FAN K1 8 1		17	20	18		P-E-102 (1/4 HP), AMU ROOM			1850		
RM D		19	20	20		TRANSMITTERS & UIT-CA1-3	615				
GE		21	40	22		HOT WATER HEATER #1		4000			
		23		24					4000		
& G		25	20	26		PUMP P RC1 1 (1/3 HP)	820				
CHEN		27	20	28		HEAT TRACE AIR INTAKE LOUVER		TBD			
FEED SAMP LEAK DET		29	20	30		SEAL POT 241-A, A & B ALARM			TBD		
G 242-AB		31	20	32		FIRE SYSTEM SUPPLY FAN SHUTDOWN	1100				
CESS		33	20	34		ION EXCHANGE COLUMN HEATER		480			
SL-114		35		36					480		
		37	20	38		RECEPTACLES RM 9	500				
		39	40	40		HOT WATER HEATER #2		4000			
WALL, CONT RM)		41	20	42		(ROOM 16)			4000		
						SUBTOTAL	6435	10640	12180		

L WATTS PHASE A 14715
L WATTS PHASE B 22700
L WATTS PHASE C 21920
TOTAL 59335

ESSENTIAL DRAWING

DESCRIPTION	REV BY DATE	CHK BY DATE	DPTG APVD DATE	ENGR / COMPANY
INCORPORATED ECN-654926 & ECN-654943	BAM 2/01			

REVISIONS

		DATE
DRAWN	VJ BENDER	3/94
CHECKED	G TILLEY	3/94
DPTG APVD	WD COLEMAN	3/94
CDG ENGR	J BERGER	3/94
APPVD	PAUL ULK	3/94
APPVD		

CHK PRINT ☐ COMMENT PRINT ☐

U S DEPARTMENT OF ENERGY
DOE Field Office Richland
Westinghouse Hanford Company

PANELBOARD SCHEDULE

SIZE	BLDG NO	INDEX NO	DWG NO	REV
B	242 A	7304	H-2-85322	1

SCALE NONE EDT 700012 SHEET 3 OF

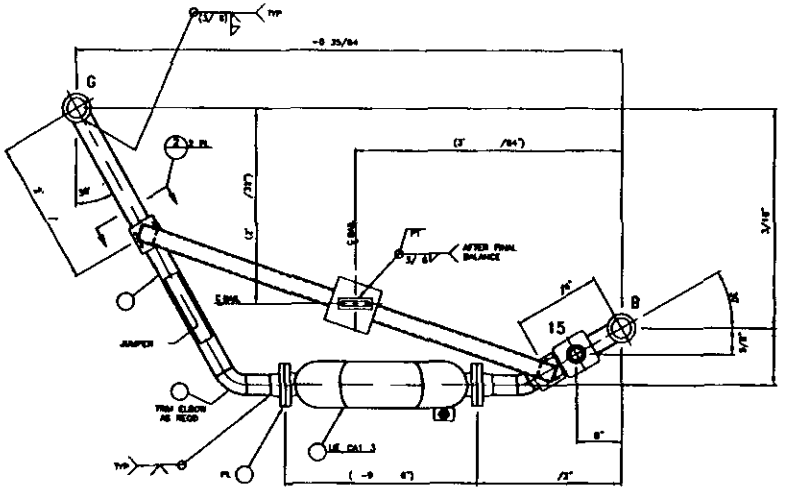
FOR FIELD VERIFICATION STATUS SEE SH 3 REV 1

DWG NO H-2 85322

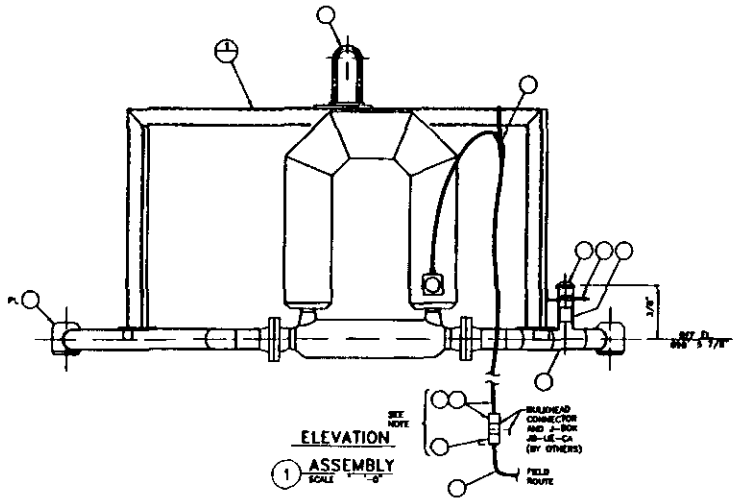
ENGINEERING CHANGE NOTICE SKETCH

ARES CORPORATION

Dwg	Sh	Rev	Prepared By	Approved By	No	Page
H-2-90977	1	1	JR BYERS		664551	13

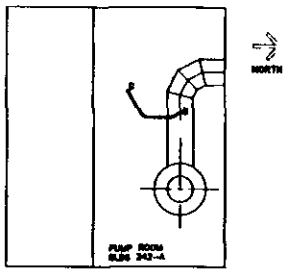


PLAN



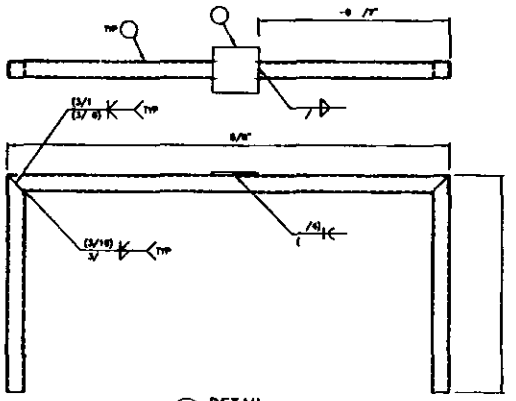
ELEVATION

1 ASSEMBLY

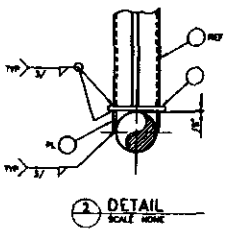


KEY PLAN

SCALE NONE



1 DETAIL



2 DETAIL

SCALE NONE

PARTS/MATERIAL LIST

ITEM NO.	QTY	PART/DASH NUMBER	NOMENCLATURE/DESCRIPTION	MATERIAL/REFERENCE	SHT	ITEM NO.
		-0	ASSEMBL			
		H- 32 30-	CONN, VERT PH	GASKET TYPE		
		H- 32446-	NOZZLE, FLANGL PN			
		-30600-	KICKPLATE SQ PN			
		H- 90	LIFTING BAIL, CS, PN			
	AR		PIPE, SCHED 40S, SEAMLESS	ASTM A3 GR 304L		
	AR		PIPE, SCHED 40S, SEAMLESS	ASTM GR 304L		
			REDUCING TEE, 3x3x2	ASTM A403 WP-S 304L		
			ELBOW SCHED 40S BW BW	ASTM A403 WP-S 304L		
			FLANGE CLASS 30 WELDNECK	ASTM 182 304L		
			METER	SEE NOTE		
	AR		.25 THK	ASTM A554 -304/304L		
			PLATE, 3/ SST	ASTM A240 TYPE 304L		
			PLATE, 3/8 SST	ASTM A240 TYPE 304L		
			PLATE, 1/2 8" SST	ASTM A240 TYPE 304L		
			STRAIN RELIEF UNIVERSAL EYE CLOSED MESH, SINGLE WEAVE	BELLOWS SRUF CAT NO 87229		
	20'		ELECTRICAL CABLE, CONDUCTOR	MICROMOTION CAT NO CPL 180		
			ELECTRICAL CONNECTOR PLUG	AMPHENOL PTDBE 88-P (003)		
			ELECTRICAL CONNECTOR SOCKET	AMPHENOL PTDBE 8-98-S-(003)		

CONTACT ARRANGEMENT

PLUG AND SOCKET WIRING TABLE

CONTACT	WIRE GAUGE	CONDUCTOR COLOR	NOTE
A	22	BLUE	
B	22	GRAY	
C	22	DRAIN WIRE/SHLD	
D			NOT USED
E			NOT USED
F	22	GREEN	
G	22	WHITE	
H	22	DRAIN WIRE/SHLD	
J			NOT USED
K			NOT USED
L	22	YELLOW	
M	22	VIOLET	
N	22	ORANGE	
P	22	DRAIN WIRE/SHLD	
R			NOT USED
S			NOT USED
T			NOT USED
U			NOT USED
V			NOT USED
W	8	BROWN	
X	22	DRAIN WIRE/SHLD	
Y			NOT USED
Z	18	RED	

NOTES

FABRICATION AND TESTING SHALL BE ACCORDANCE WITH ASME B3 PROCESS PIPING CATAGORY NORMAL. M-PROCESS EXAMINATION SHALL SUBSTITUTED FOR WELDWELD SHADEDMPHYT WELDING SHALL BE ACCORDANCE WITH AWS (DUMMAGE WELDING STRUCTURAL WELDING CODE STAINLESS STEEL WELDER PROCEDURES QUALIFICATIONS PER ASME SECTION ARE AC EPTABLE

JUMPER ASSEMBL WEIGHT (APPROX) 320 LBS

PAINT LIFTING BAIL (ITEM WITH AMERLOCK 400 PER MANUFACTURER INSTRUCTIONS FINISH COLOR SHALL BE YELLOW

METER SHALL BE MICROMOTION ELITE MASS FLOW AND DENSITY METER, WITH ANSI CLASS 30 WELD NECK RAISED FACE FLANGES APPROXIMA WEIGHT 165 LBS. PART NUMBER CMF300M355MRAUEZZZ BAG NUMBER UE-CA

HYDROST TIC TEST 200-220 PSIG.

FIELD ROUTE ELECTRICAL CABLE TO JUNCTION BOX JB-UE-CA CABLE LENGTH TO BE APPROXIMATEL 30'-0" TERMINATE CONDUCTORS ON AMPHENOL PLUG AND SOCK PER CONTACT ARRANGEMENT AND PLUG AND SOCKET WIRING TABLE. SEE DRAWING H- -99074, SHEET

DRAFTING NOTE
DO NOT REDUCE PRINT SIZE

CAD FILE 664551 g 13

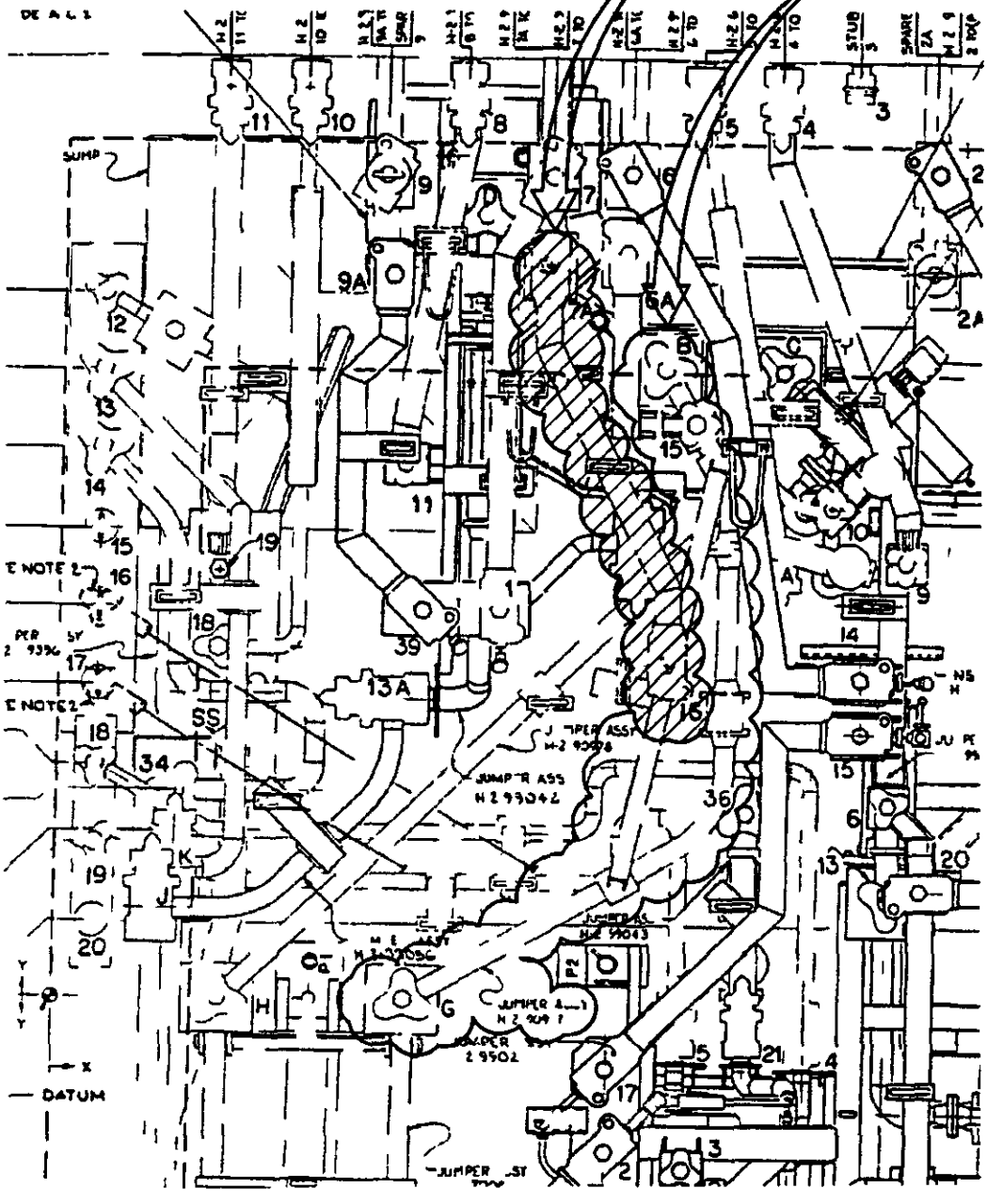
ARES CORPORATION — Applied Research & Engineering Solutions

ENGINEERING CHANGE NOTICE SKETCH

R f Dwg	Sh	Rev	Prepared By	Checked By	ECN N	Pag
H-2-99009	1	2	JR BYERS		664551	14

REMOVE ELECTRICAL JUMPER 7A-16

MODIFY JUMPER G-B (16) (15)
SEE PAGE 13



ARES CORPORATION — Applied Research & Engineering Solutions

ENGINEERING CHANGE NOTICE SKETCH

Ref Dwg	Sh	Rev	Prepared By	Checked By	ECN No	Pg
—	—	—	K HALE		664551	15

NOTE. For information only DO NOT INCORPORATE ON DRAWING

Date	7/9/2001			Sheet	1	of	1	
Company			Coriolis Multivariable	Spec No		Rev	0	
Service			Instrument Data Sheet	Contract		PO		
				Req		By	MFG	
Manufacturer	Micro Motion Inc			Chkd	DPM	Appr	DSH	

Service	1	Sensor Tag(s)	UE-CA1-3				
	2	Transmitter Tag(s)	UIT-CA1-3				
	3	Fluid State / Fluid Name	Slurry	NUCLEAR WASTE			
	4	Flow / Min / Operating / Max / Design	0 000	160 000	300 000		USGPM
	5	Pressure / Min / Operating / Max / Design	0 000	20 000	35 000		psig
	6	Temperature / Min / Operating / Max / Design	40 000		200 000		F
	7	Specific Gravity or Density (max)	1 80000 g/cm3				
	8	Viscosity (max)	100 00 cP				
Sensor	9	Manufacturer and Model Number	Micro Motion CMF300M355NRJUEZZZ				
	10	Description	Micro Motion Coriolis ELITE sensor 3 inch 316L stainless steel				
	11						
	12						
	13						
	14	Process Connections	3-inch ANSI 150 lb weld neck raised face flange				
	15	Approval	UL				
	16	Wetted Parts	316L stainless steel				
	17	Mass Flow Accuracy @ Max Flow (% of rate)	0 11%				
	18	Density Accuracy @ All Rates	0 0005 g/cm3				
	19	Pressure Drop @ Max Flow	4 008 psi				
	20	Calibration Type / Rate / Units					
	21	Custom Calibration Points	5 point calibration for massflow				
	22	Density from Volume to Mass Conversion					
	23	Special Unit Text / Totalizer Text					
	24	Base Units Flow / Time / Conversion					
	25	Sensor Notes					
Transmitter	26	Manufacturer and Model Number	Micro Motion RFT9739D4SUA				
	27	Description	Coriolis multivariable transmitter remote				
	28		field mount with display NEMA 4X				
	29						
	30						
	31	Input Power	85 250 VAC				
	32	Approval	UL				
	33	Transmitter Flow Unit Mass / Volume			GPM		
	34	Transmitter Units Density / Temperature	g/cm3				
	35	Special Mass Units Text / Totalize Text					
	36	Base Mass Units Flow / Time / Conversion					
	37	Special Voulme Unit Text / Totalize Text					
	38	Base Volume Units Flow / Time / Conversion					
	39	Output 1 Type / Variable	4 20 mA		Volumetric Flow		
	40	Output 1 Scaling / LRV / URV / Units	0 300 GPM				
	41	Output 2 Type / Variable	4 20 mA		Density		
	42	Output 2 Scaling / LRV / URV / Units	0 3 g/cm3				
	43	Output 3 Type / Variable	15 VDC		Failure Alarm		
	44	Output 3 Setting / Rat / Units	0 VDC or 15 VDC		0 VDC indicates transmitter or sensor failure		
	45	Transmitter Notes					
Cable	46	Manufacturer and Model Number	Micro Motion CPLTA1A100				
	47	Description	Armoured cable PVC insulation braid overall tainless				
	48		teel shield 100 ft (30 m)				
Notes	49						
	50						
	51						
	52						
	53	Peripheral Tag(s)	Tag sensor and transmitter with stainless steel tags				
	54	Operations and Maintenance Manual	Supply operation and maintenance manual				

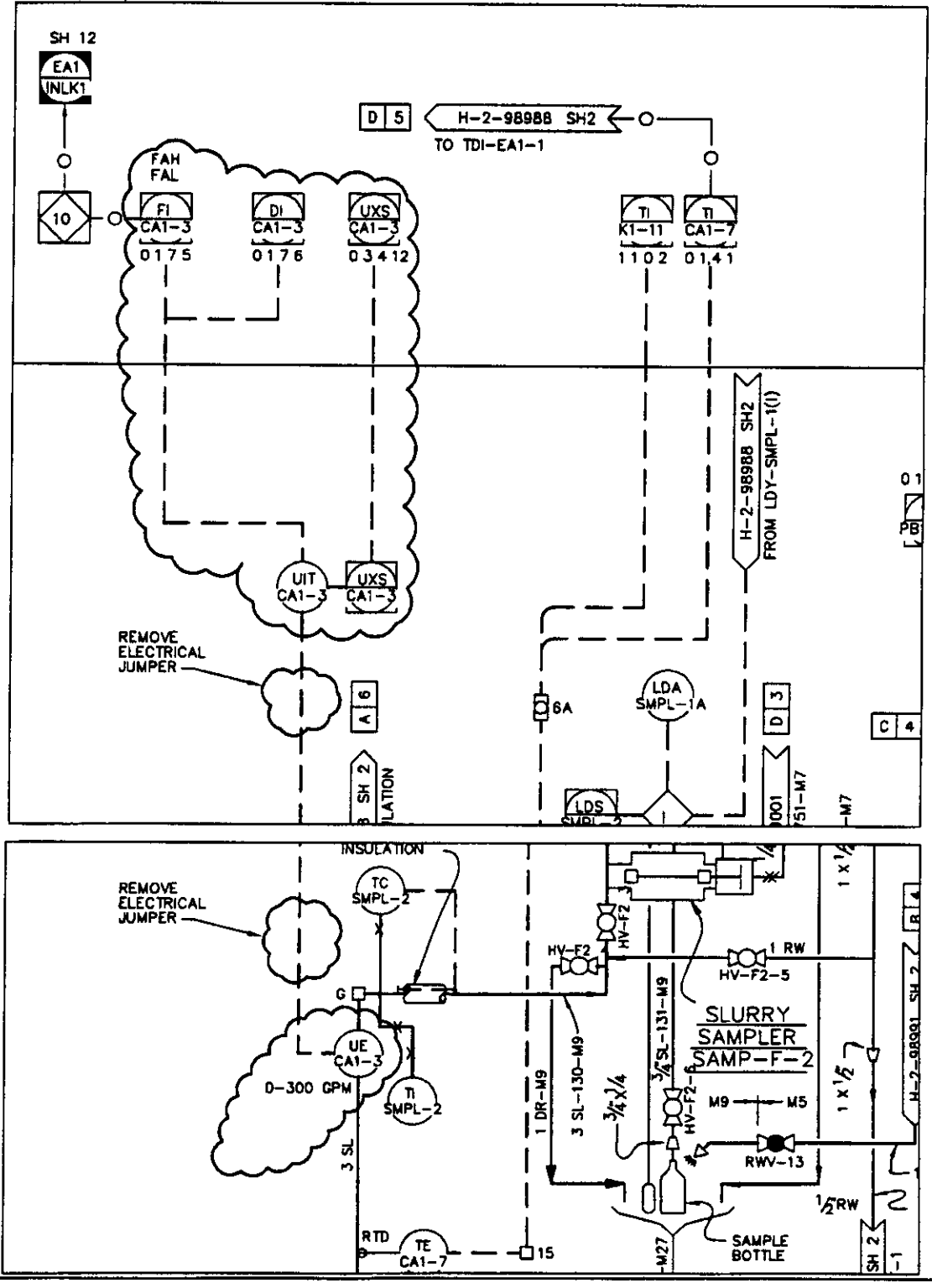
ARES CORPORATION — Applied Research Engineering Sciences

ENGINEERING CHANGE NOTICE SKETCH

R f Dwg	Sh	Rev	Prepared By	Checked By	ECN No	P g
H-2-98989	1	11	K HALE		664551	16

ZONE A-E/8

REVISE FLOW METER TAGS TO SHOW NEW FLOW MASS DENSITY METER/TRANSMITTER UE/UIT-CA1-3 NUMBERS

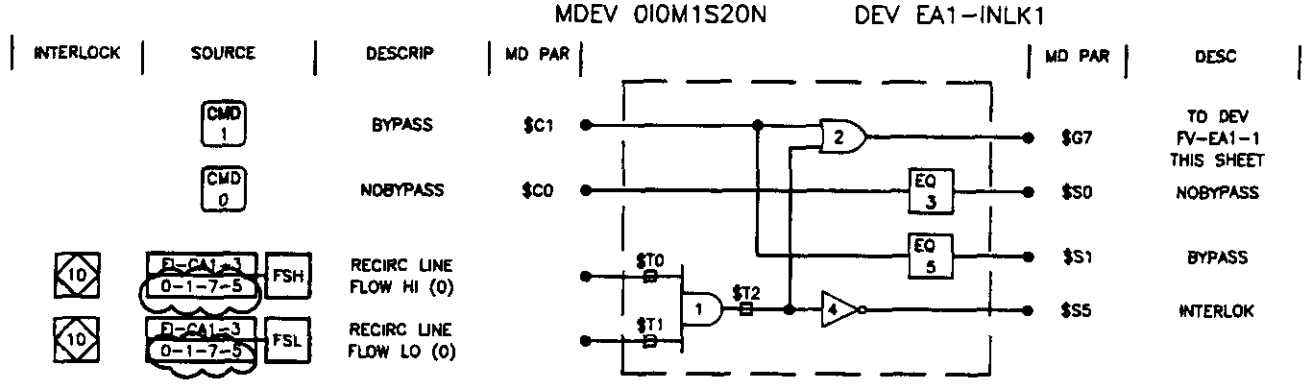


664551-1

ARES COR ORATION	ENGINEERING CHANGE NOTICE SKETCH					
Ref Dwg	Sh	Rev	Prepared By	Checked By	ECN No	P g
H-2-99949	12	1	R E WILSON		664551	17

ZONE B/4

REVISE PCM MULTIPLIXER BOARD AND POINT ADDRESSES ON LOGIC DIAGRAM



S

ESSENTIAL

CAM 8/21/01

ENGINEERING CHANGE NOTICE

Page 1 of 34

1 ECN 664553

Proj ECN

CPR 13A & 13B

2 ECN Category (mark one)	3 Originator's Name Organization MSIN and Telephone No	4 USQ Required?	5 Date
Supplemental (●)	David S Haring ARES Corporation 946 8946	(●) Yes ( ) No	07/26/01
Direct Revision ( )			
Change ECN ( )			
Temporary ( )			
Standby ( )			
Supersedure ( )			
Cancel/Void ( )			

6 Project Title/No./Work Order No	7 Bldg /Sys /Fac No	8 Approval Designator
242 A Evaporator Life Extension Upgrades	242 A	T Q N
9 Document Numbers Changed by this ECN (includes sheet no and rev)	**10 Related ECN No(s)**	**11 Related PO No**
See Block 13a	N/A	N/A

12a Modification Work	12b Work Package No	12c Modification Work Completed	12d Restored to Original Condition (Temp or Standby ECNs only)
(●) Yes (fill out Blk 12b) ( ) No (NA Blks 12b 12c 12d)	EL-01-00451	Design Authority/Cog Engineer Signature & Date	N/A Design Authority/Cog Engineer Signature & Date

13a Description of Change

13b Design Baseline Document? (●) Yes ( ) No

H-2-99043 Sh 1 Rev 2 Jumper has been redesigned with a manual ball valve and two pressure taps to be used for testing Replace existing design shown on this drawing (including material list and notes) with new design shown on page 3 of this ECN

H 2 98989 Sh 1 Rev 11 add Valve HV PB2 1 and pressure taps as shown on Page 4 of this ECN

USQ # LW-01-031

14a Justification (mark one)	14b Justification Details
Criteria Change ( )	This change is required in order to support the 242-A Evaporator Life Extension activities
Design Improvement (●)	
Environmental ( )	
Facility Deactivation ( )	
As Found ( )	
Facilitate Const ( )	
Const Error/Omission ( )	
Design Error/Omission ( )	

15 Distribution (include name MSIN and no of copies)

CD Skogley	S6 71	(1)	WCC Planning	S6 72	(1) *
EA McNamar	S6 72	(1) *			
DL Plyckt	S6 71	(1)			
NJ Sullivan	S6 72	(1)			
MC Teats	S6 72	(1)			
RW Szelmeczka	S6 72	(1)			
JM Isdell	B4 39	(1)			
MW Bowman	S6 72	(1)			

RELEASE STAMP

AUG 22 2001

DATE

STA. 30

HANFORD RELEASE ID 25

ENGINEERING CHANGE NOTICE

1 ECN (use no from pg 1): 664553

16 Design Verification Required	17 Cost Impact		18 Schedule Impact (days)
	ENGINEERING	CONSTRUCTION	
Peer Review			
◉ Yes	Additional ○ $ N/A	Additional ○ $ N/A	Improvement ○ N/A
○ No	Savings ○ $ N/A	Savings ○ $ N/A	Delay ○ N/A

19 Change Impact Review Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13 Enter the affected document number in Block 20

SDD/DD	☒ CAM		Seismic/Stress Analysis	☐		Tank Calibration Manual	☐
Functional Design Criteria	☐ 8-8-01		Stress/Design Report	☐		Health Physics Procedure	☐
Operating Specification	☐		Interface Control Drawing	☐		Spares Multiple Unit Listing	☐
Criticality Specification	☐		Calibration Procedure	☐		Test Procedures/Specification	☐
Conceptual Design Report	☐		Installation Procedure	☐		Component Index	☐
Equipment Spec	☐		Maintenance Procedure	☒ CAM 8-8-01		ASME Coded Item	☐
Const Spec	☐	N/A	Engineering Procedure	☐		Human Factor Consideration	☐
Procurement Spec	☐		Operating Instruction	☐		Computer Software	☐
Vendor Information	☐		Operating Procedure	☒		Electric Circuit Schedule	☐
OM Manual	☐		Operational Safety Requirement	☐		ICRS Procedure	☐
FSAR/SAR	☐		IEFD Drawing	☐		Process Control Manual/Plan	☐
Safety Equipment List	☐		Cell Arrangement Drawing	☐		Process Flow Chart	☐
Radiation Work Permit	☐		Essential Material Specification	☐		Purchase Requisition	☐
Environmental Impact Statement	☐		Fac Proc Samp Schedule	☐		Tickler File	☐
Environmental Report	☐		Inspection Plan	☐		_____	☐
Environmental Permit	☐		Inventory Adjustment Request	☐		_____	☐

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

Document Number/Revision	Document Number/Revision	Document Number/Revision
N/A CAM 8-21-01		
TD-600-010		

21 Approvals

	Signature	Date		Signature	Date
Design Authority	E.A. McLaren	8-8-01	Design Agent		
Cog Eng	N.J. Sullivan for E.A. McLaren	8-8-01	PE		
Cog Mgr	K.J. Lueck for K.C. Lueck	8-13-01	QA		
QA	M.J. Wilson	8/14/01	Safety		
Safety			Design		
Environ			Environ		
Other	[illegible]	8-21-01	Other		
Peer Review Manager	M.C. Dent	8/13/01			

DEPARTMENT OF ENERGY

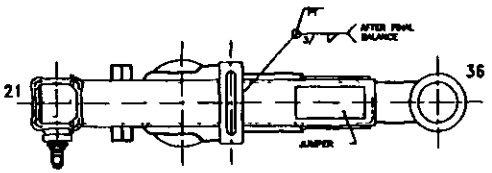
Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

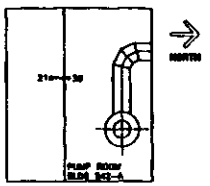
ARES

ENGINEERING CHANGE NOTICE SKETCH

No Dwg	Sh	Rev	Prepared By	Checked By	ECN No	Page
H-2-99043	1	2	JR BYERS	DS HARING	664553	3

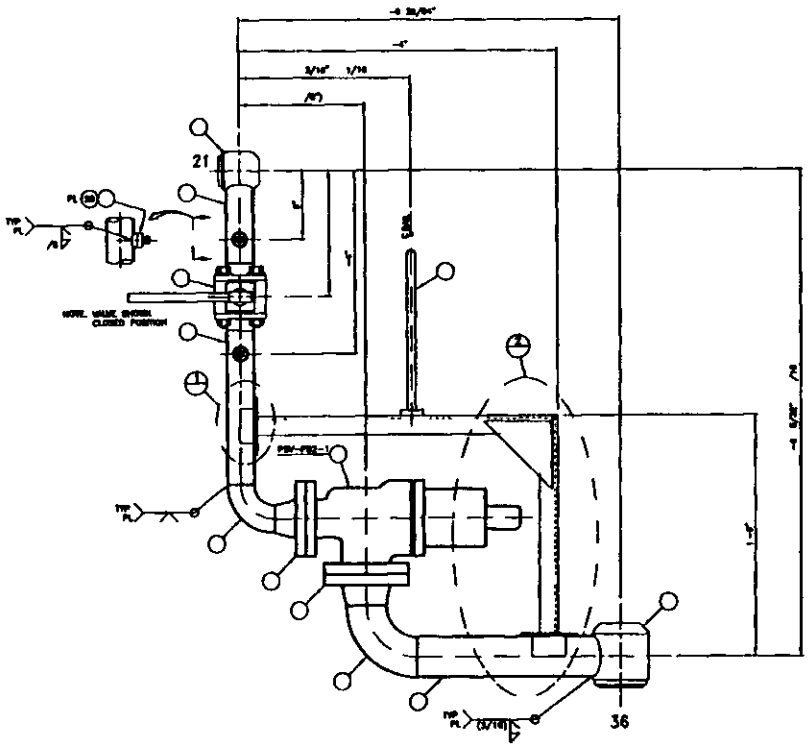


PLAN



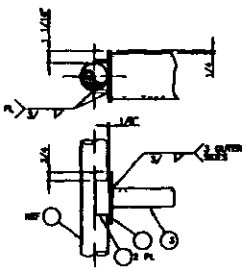
KEY PLAN
SCALE: NONE

ITEM NO.	QTY	PART/DWG NUMBER	NOMENCLATURE/DESCRIPTION	MATERIAL/REFERENCE	UNIT	ITEM NO.
	X	-010	ASSEMBLY			
		H-2-33429-	CONN, HORIZ ASSEMBLY	GASKET TYPE		
		H-2-33430-	CONN, VERT ASSEMBLY	GASKET TYPE		
		H-2-001	LIFTING BAR, SST ASSEMBLY			
			VALVE, SAFETY RELIEF (PSV-PR2-) 300# 304	SEE NOTE		
			BALL VALVE, 2"	SEE NOTE		
	AR		PIPE, SCHED 40S, SEAMLESS	ASME A376 GR TP 304L		
	AR		PIPE, SCHED 40S, SEAMLESS	ASME A3 GR 304L		
			ELBOW, SCHED 40S BW SR	ASME A403 WP-S 304L		
			ELBOW, SCHED 40S BW SR	ASME A403 WP-S 304L		10
			FLANGE, CLASS 300 WELDNECK	ASTM 182 304L		
			FLANGE, CLASS 150 WELDNECK	ASME SA 304L		
	AR		CHANNEL, C4x5.4	ASTM A276		
			PLATE, /4 3/16" 3" SQ	ASME SA-240 TYPE 304L		
			PLATE, /4 3/ SQ	ASTM A240 TYPE 304L		
			PLATE, / /2" /2" SQ	ASTM A240 TYPE 304L		
			PLATE, /4 8" 8" SQ	ASME SA-240 TYPE 304L		
			SUBSET PLATE, /4 8" 45°	ASTM A240 TYPE 304L		
			THREADOLET /4" NPT	ASME A182 304L		10
			PIPE PLUG, /4 NPT SQ	CAJON # SS-4-P		20

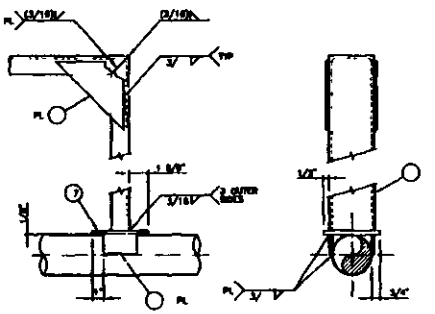


ELEVATION

1 ASSEMBLY
SCALE: 3" = 1'-0"



1 DETAIL
SCALE: NONE



2 DETAIL
SCALE: NONE

NOTES

FABRICATION AND TESTING SHALL BE IN ACCORDANCE WITH ASME B31.3, PROCESS PIPING, CATEGORY NORMAL FLUID SERVICE. ALL PROCESS CONTAINING SHALL BE SUBSTANTIATED FOR REQUIRED RADIOGRAPHY. WELDING SHALL BE IN ACCORDANCE WITH ANSI B1.1 (GUIDANCE WELDING), STRUCTURAL WELDING CODE-STAINLESS STEEL. WELDER PROCEDURES AND QUALIFICATIONS PER ASME SECTION IX ARE ACCEPTABLE.

JUMPER ASSEMBLY WEIGHT (APPROX) 34 LBS

PAINT ALL EXPOSED CARBON STEEL SURFACES WITH AMERLOCK 400 PER MANUFACTURER'S INSTRUCTIONS. FINISH COLOR SHALL BE GREY. PAINT TOP INCHES OF LIFTING BAR (MIN) YELLOW FOR TARGETING.

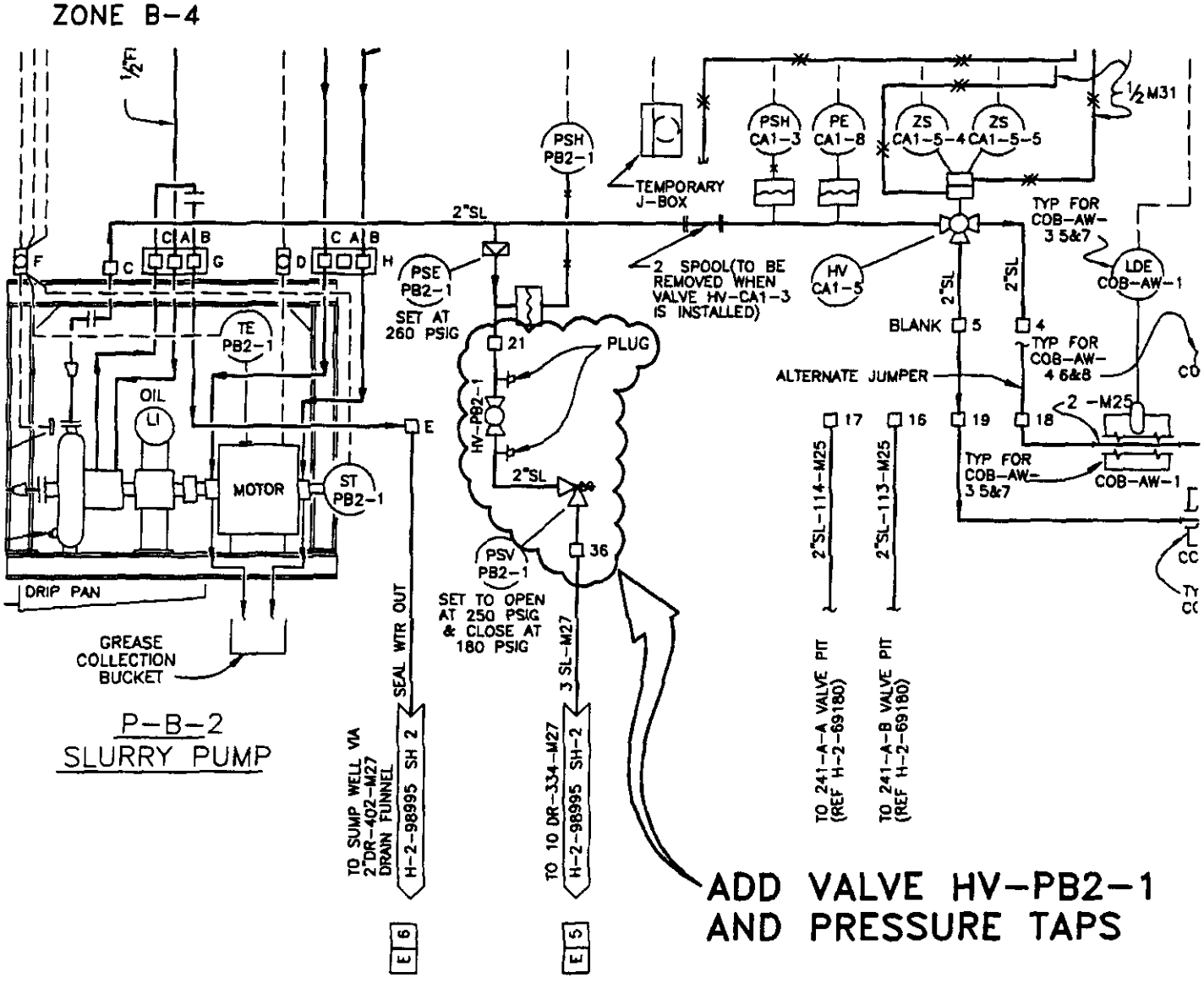
SAFETY RELIEF VALVE (ITEM 5) SHALL BE CROSBY STYLE JLT-86S-2S-5-4 WITH ORIFICE AND SUNA-4 "D" RATED. VALVE SHALL BE SET TO OPEN 150 PSIG.

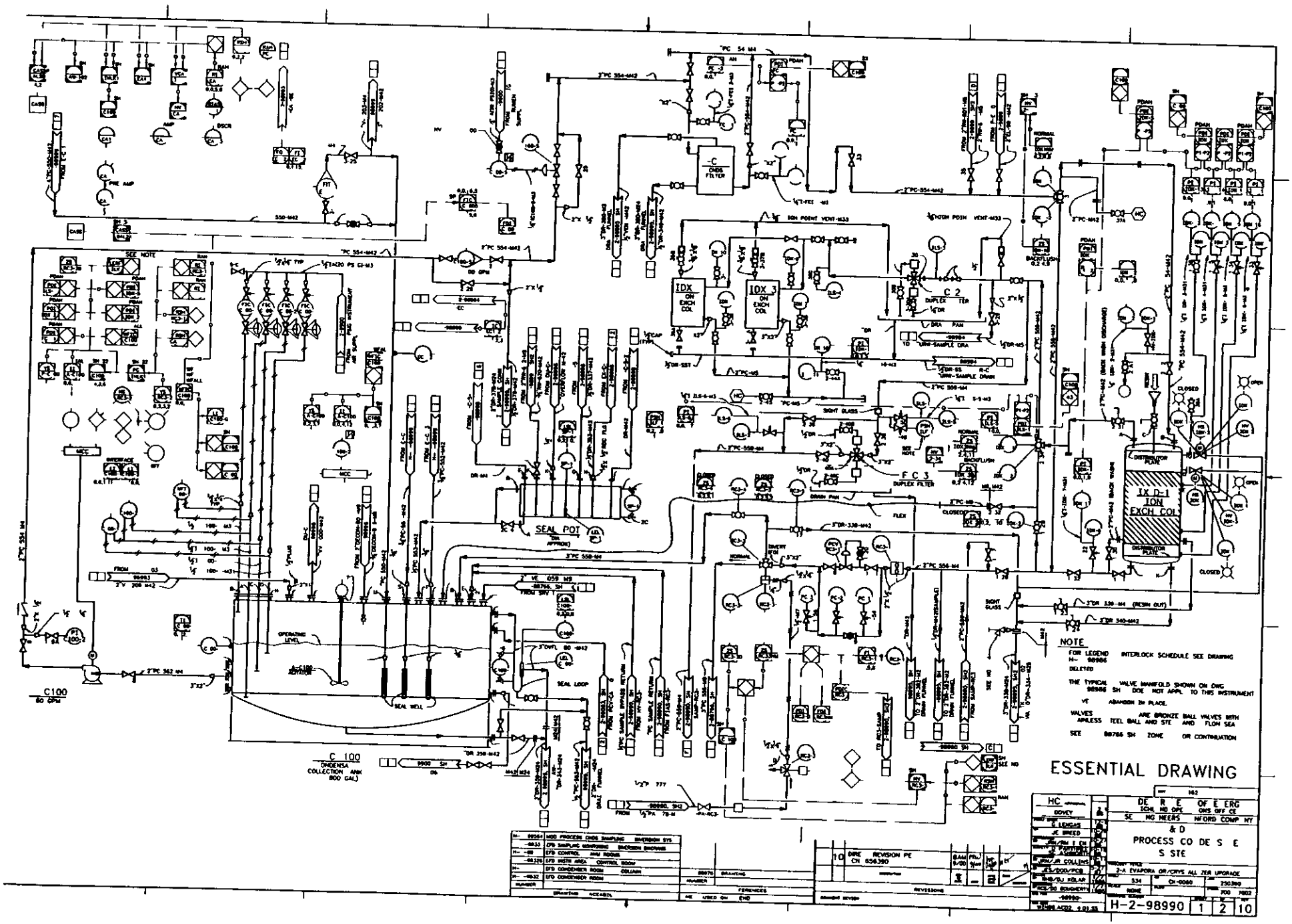
BALL VALVE SHALL BE 2" FULL PORT WITH BUTT WELD (SCHED 40) END CONNECTIONS, AND LOCKING HANDLE. MATERIAL SHALL BE 316 BODY BALL STEEL WITH REINFORCED PTE SEAT AND PTE BODY SEAL. WORCESTER PART NUMBER 2"-438-6-6-6-- -0814, OR APPROVED EQUAL.

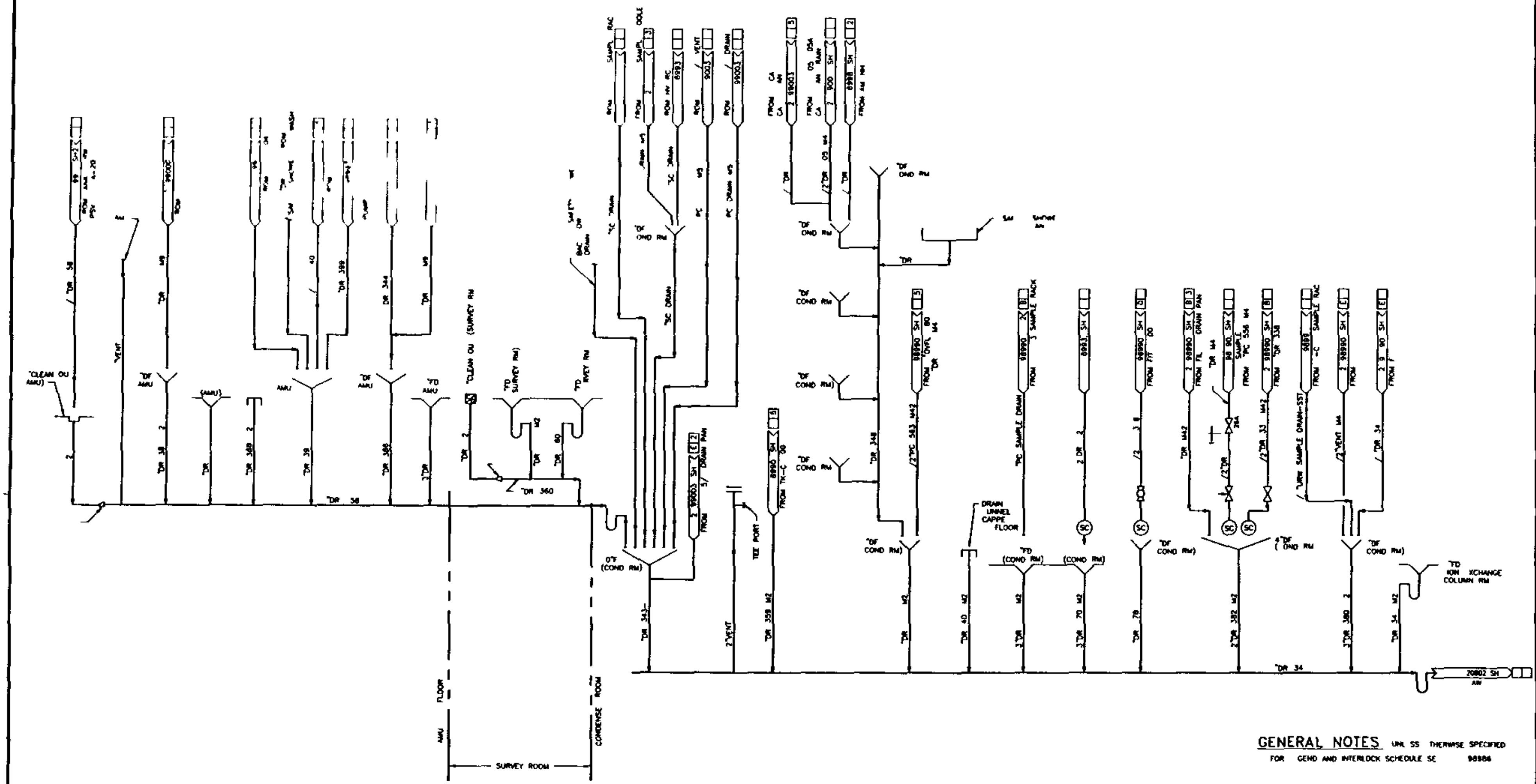
HYDROSTAT JUMPER 438 PSI UPSTREAM OF SAFETY RELIEF VALVE AND 300 PSI DOWNSTREAM.

CAD FILE 664553 page 3

ARES CORPORATION	ENGINEERING CHANGE NOTICE SKETCH					
Ref Dwg	Sh	Rev	Prepared By	Checked By	ECN N	Pg
H-2-98989	1	11	JR BYERS	M WHITE	664553	4




SEAL POT
IX D-1 ION EXCH COL
C 100
CONDENSA COLLECTION TANK (600 GAL)
C100
60 GPM
NOTE
ESSENTIAL DRAWING
PROCESS CO DE S E
S STE
H-2-98990



GENERAL NOTES UNL SS THERWSE SPECIFIED
FOR GEND AND INTERLOCK SCHEDULE SE 98986

DWG NO	TITLE
	FD INSTRUMENT AREA
6932	FD CONDENSE ROOM
6932	FD PUM EVAP ROOMS

DR WING TRACEABILITY LIST

REF NUMBER	TITLE
99028	PUMP ASSEMBL
2 99003	P&ID FIL RED RAW
9900	&ID JET GANG VALVE SYS
9900	&ID PROCESS INSTR AIR
99000	&ID ANTI FOAM YSTE
98998	&ID VESSEL VENT YS
9899	P&ID ELUANT SYSTEM
9899	P& DECONTAMINATION SYS
2 9899	P& USE RAW WATER YS
H- 9899	TEAM CONDENSATE
9899	&ID RAW WATER SYSTEM
98990	&ID PROCESS CONDENSA
98989	&ID SLURRY SYSTEM
98988	&ID EVAP RECIRC SYSTEM
9898	GEND INTL SCHED
38	EFD AW ANK ARM
	PIPING ARR PUMP ROOM
98970	DRAWING LIST

REFERENCES — USE OF END ITE

12 INCORPORATED EC 86 30

REVISIONS

ESSENTIAL DRAWING

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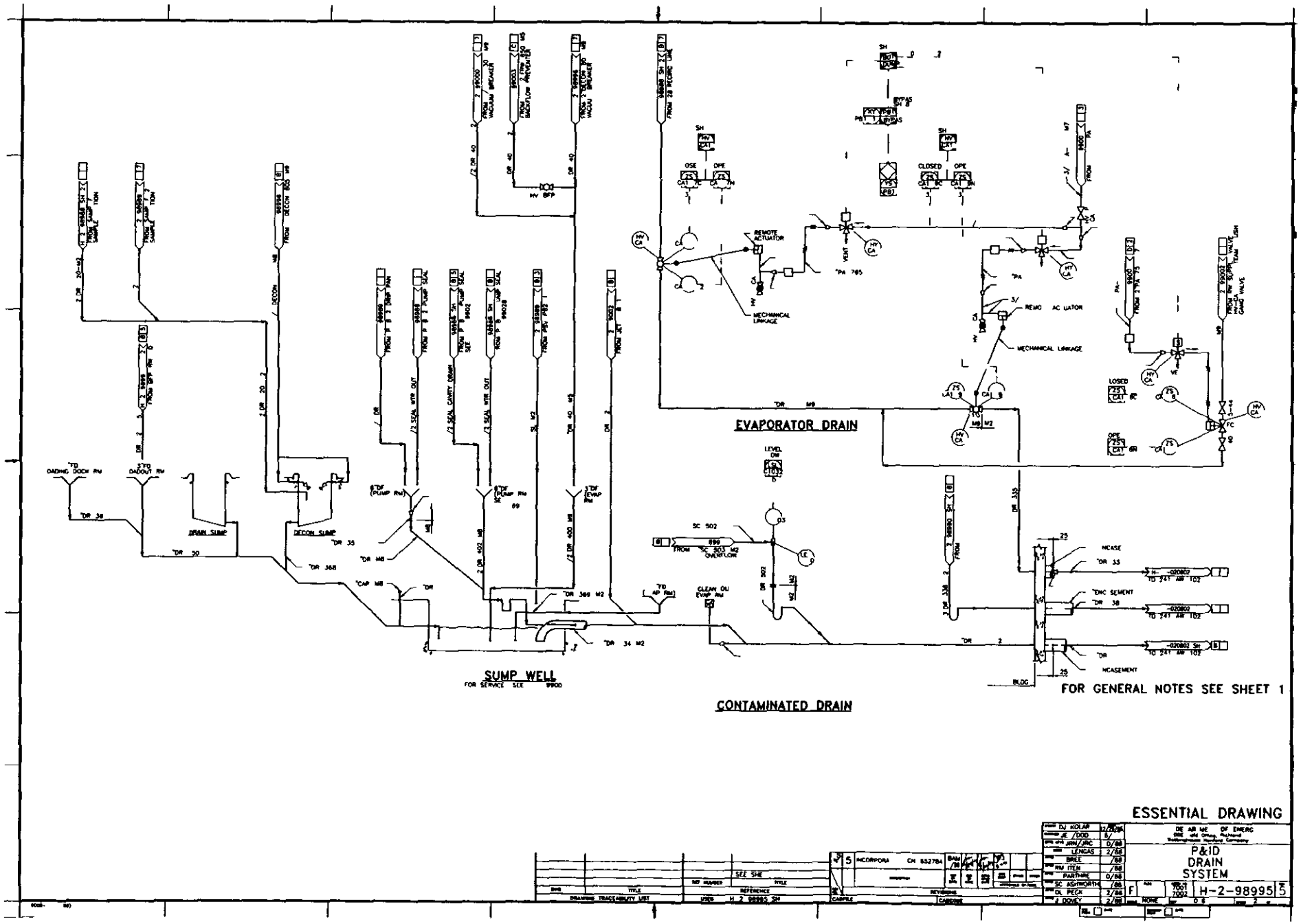
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FOR SERVICE SEE 9900
CONTAMINATED DRAIN
DRAIN SUMP
DECON SUMP
REMOTE ACTUATOR
MECHANICAL LINKAGE
REMO AC UATOR
MECHANICAL LINKAGE
HV BFP
FROM VACUUM BREAKER
FROM BACKFLOW PREVENTER
FROM 28 RECIRC LOOP
FROM SAMPLE PUMP
FROM DECON BOO
FROM DRIP PAN
FROM SEAL PUMP
FROM SEAL CAVITY DRAIN
FROM SEAL WTR OUT
FROM PRI PRZ
FROM JET
FROM SC 503 M2 OVERFLOW
TO LOADING DOCK RM
TO DAOUT RM
TO AP RM
CLEAN OU EVAP RM
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NCASE
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FOR GENERAL NOTES SEE SHEET 1
ESSENTIAL DRAWING
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DRAWING TRACEABILITY LIST
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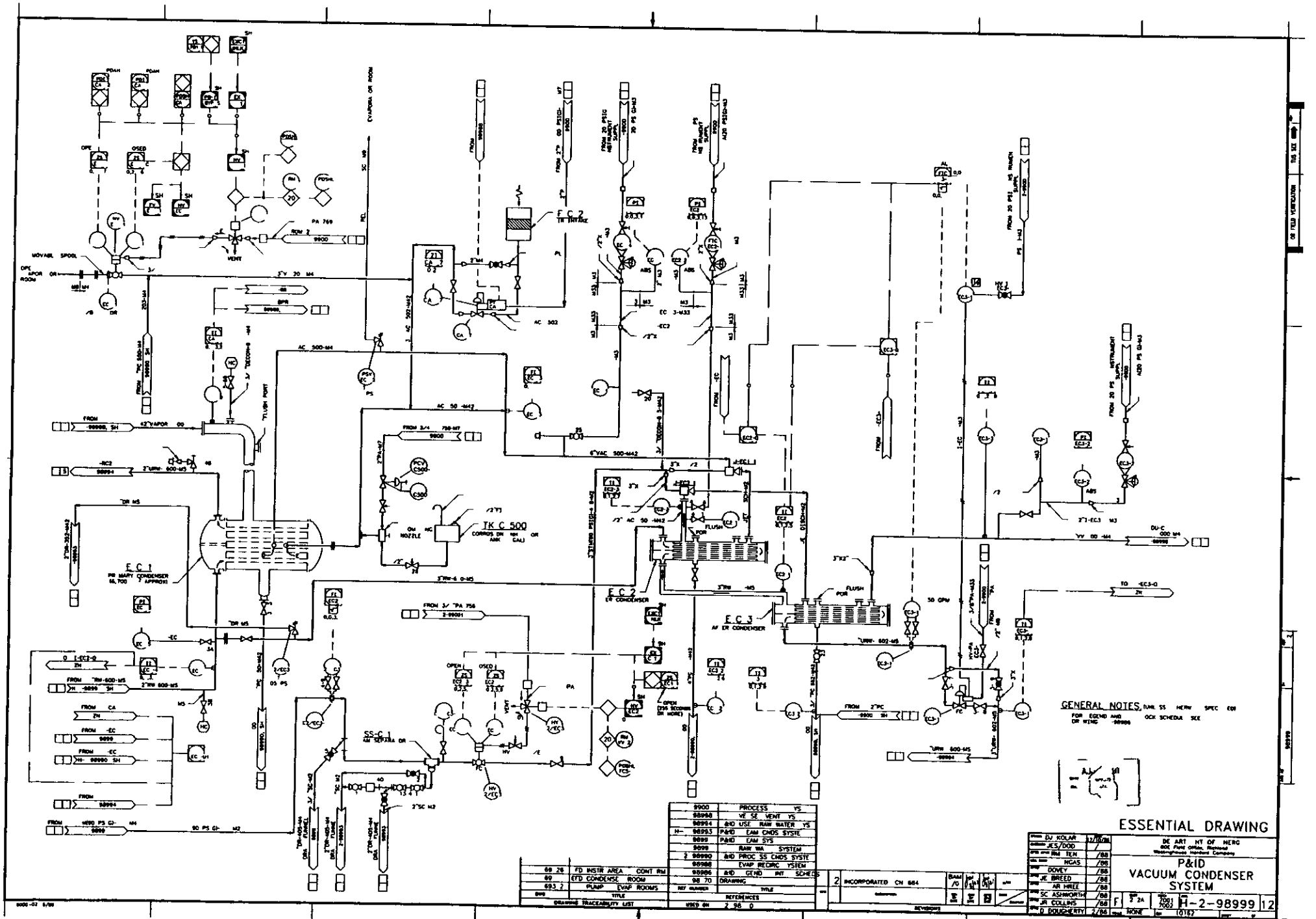
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EC 3
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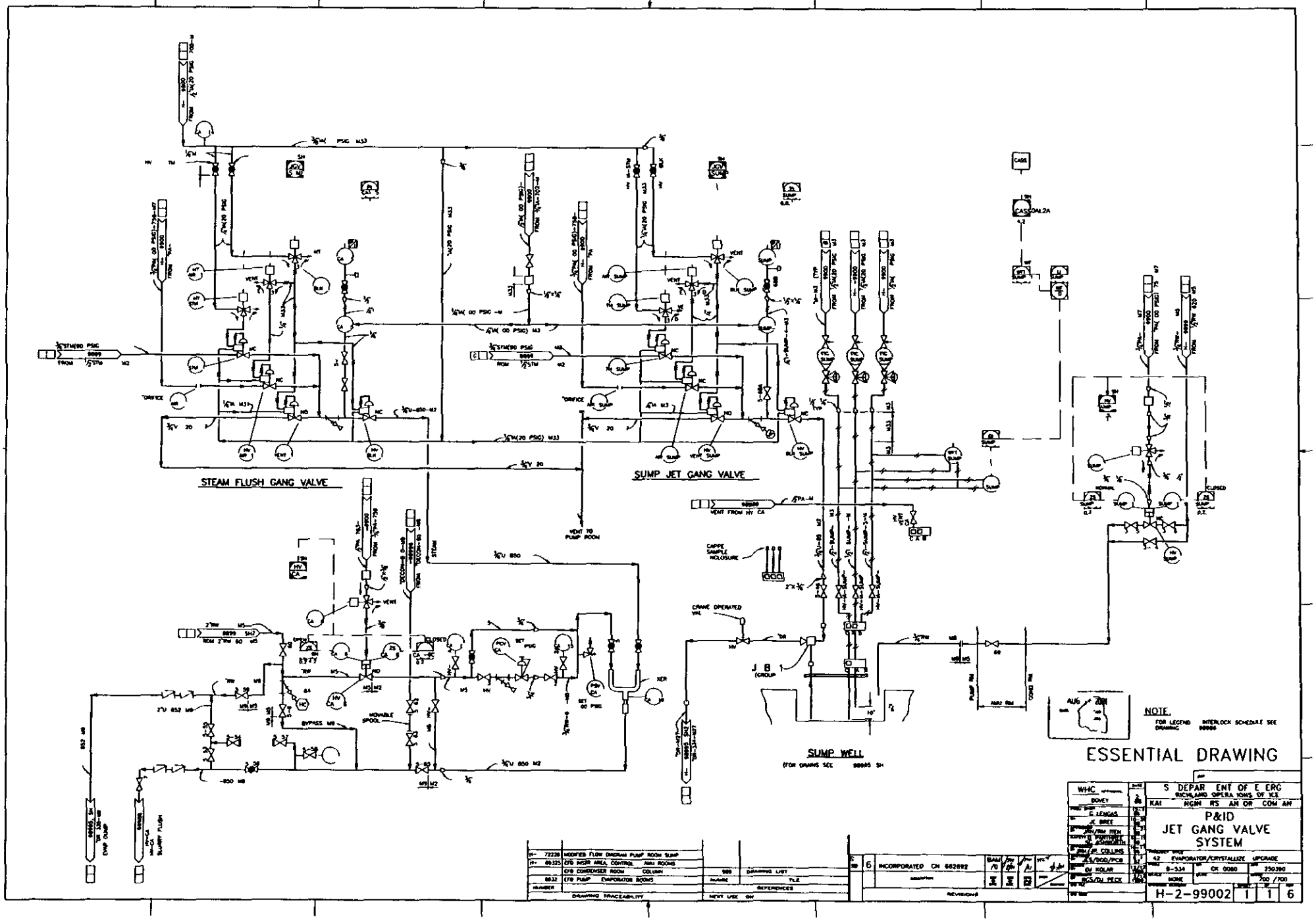
STEAM FLUSH GANG VALVE
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SUMP WELL
ESSENTIAL DRAWING
NOTE.
P&ID
JET GANG VALVE
SYSTEM
H-2-99002

S

ENGINEERING CHANGE NOTICE ESSENTIAL

CPF 13A, 13B

Page 1 of 7

1 ECN 647885

Proj ECN

2 ECN Category (mark one)	3 Originator s Name Organization MSIN and Telephone No	4 USQ Required?	5 Date
Supplemental [X] Direct Revision [] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	TM GALIOTO 32230 S6 72 373 4894	[X] Yes [] No Lw-98-026	06 15 98
	6 Project Title/No /Work Order No PT-CA1 5 UPDATE	7 Bldg /Sys /Fac No 242A/200E	8 Approval Designator NA
	9 Document Numbers Changed by this ECN (includes sheet no and rev) SEE BLOCK 13A	10 Related ECN No(s) NA	11 Related PO No NA

12a Modification Work	12b Work Package No	12c Modification Work Complete	12d Restored to Original Condition (Temp or Standby ECN only)
[X] Yes (fill out Blk 12b) [] No (NA Blks 12b 12c 12d)	EL 97 00531	Design Authority/Cog Engineer Signature & Date	NA Design Authority/Cog Engineer Signature & Date

13a Description of Change
H 2-99002 SH1 REV 5
SEE PAGE 4 THIS ECN

13b Design Baseline Document? [X] Yes [] No

14a Justification (mark one)

Criteria Change	[X]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As Found	[]	Facilitate Const	[]	Const Error/Omission	[]	Design Error/Omission	[]

14b Justification Details
The pressure transmitter is no longer used or required It is being physically removed from service The lines to and from the pressure transmitter will be capped

15 Distribution (include name MSIN and no of copies)

TM GALIOTO	S6 72*	RF WEIS	S6 71
NJ SULLIVAN	S6 72	RS WEBER	S6 71
JE GEARY	S6 71	* = ADVANCED COPY	
J ISDELL	S6 17*		
MW BOWMAN	S6 72		
DL FLYCKT	S6 71		

*WCC PLANNING S6-72

RELEASE STAMP
JUN 30 1998
DATE:
STA. 30
HANFORD RELEASE
ID: 25

A 7900 013 2 (05/96) GEF095

ENGINEERING CHANGE NOTICE

1 ECN (use no from pg 1): 647885

16 Design Verification Required	17 Cost Impact				18 Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[X] Yes	Additional	[ ] $	Additional	[ ] $	Improvement	[ ]
[ ] No	Savings	[ ] $NA	Savings	[ ] $NA	Delay	[ ] NA

19 Change Impact Review Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13 Enter the affected document number in Block 20

SDD/DD	[ ]	Seismic/Stress Analysis	[ ]	Tank Calibration Manual	[ ]
Functional Design Criteria	[ ]	Stress/Design Report	[ ]	Health Physics Procedure	[ ]
Operating Specification	[ ]	Interface Control Drawing	[ ]	Spares Multiple Unit Listing	[ ]
Criticality Specification	[ ]	Calibration Procedure	[ ]	Test Procedures/Specification	[ ]
Conceptual Design Report	[ ]	Installation Procedure	[ ]	Component Index	[X]
Equipment Spec	[ ]	Maintenance Procedure	[ ]	ASME Coded Item	[ ]
Cost Spec	[ ]	Engineering Procedure	[ ]	Human Factor Consideration	[ ]
Procurement Spec	[ ]	Operating Instruction	[ ]	Computer Software	[ ]
Vendor Information	[ ]	Operating Procedure	[X]	Electric Circuit Schedule	[ ]
OM Manual	[ ]	Operational Safety Requirement	[ ]	ICRS Procedure	[ ]
FSAR/SAR	[ ]	IEFD Drawing	[ ]	Process Control Manual/Plan	[ ]
Safety Equipment List	[ ]	Cell Arrangement Drawing	[ ]	Process Flow Chart	[ ]
Radiation Work Permit	[ ]	Essential Material Specification	[ ]	Purchase Requisition	[ ]
Environmental Impact Statement	[ ]	Fac Proc Samp Schedule	[ ]	Tickler File	[ ]
Environmental Report	[ ]	Inspection Plan	[ ]	None	[ ]
Environmental Permit	[ ]	Inventory Adjustment Request	[ ]		[ ]

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

Document Number/Revision	Document Number/Revision	Document Number Revision
TO-6000-010		
EE-01553		

21 Approvals

	Signature	Date		Signature	Date
Design Authority	TM GALIOTO JM Galioto	6/15/98	Design Agent	JM Galioto	6/15/98
Cog Eng	JM Galioto	6/15/98	PE		
Cog Mgr	MJ Sullo	6 30 98	QA		
QA			Safety		
Safety			Design		
Environ			Environ		
Informal Review	MJ Sullo	6 30-98	Other		

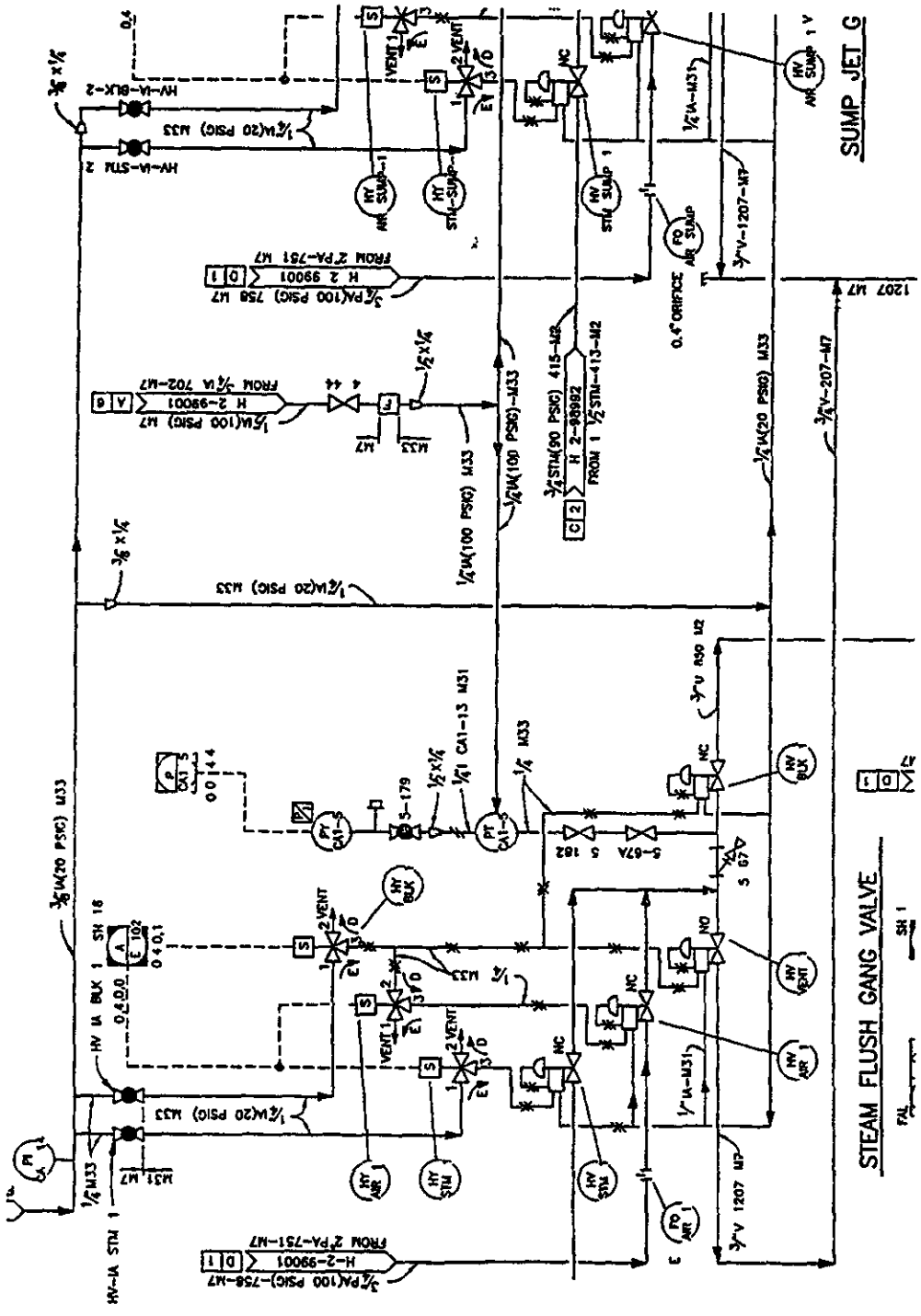
DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

H-2-99002 Sh1 Rev5

WAS



H-2-99002 Sh1 Rev5

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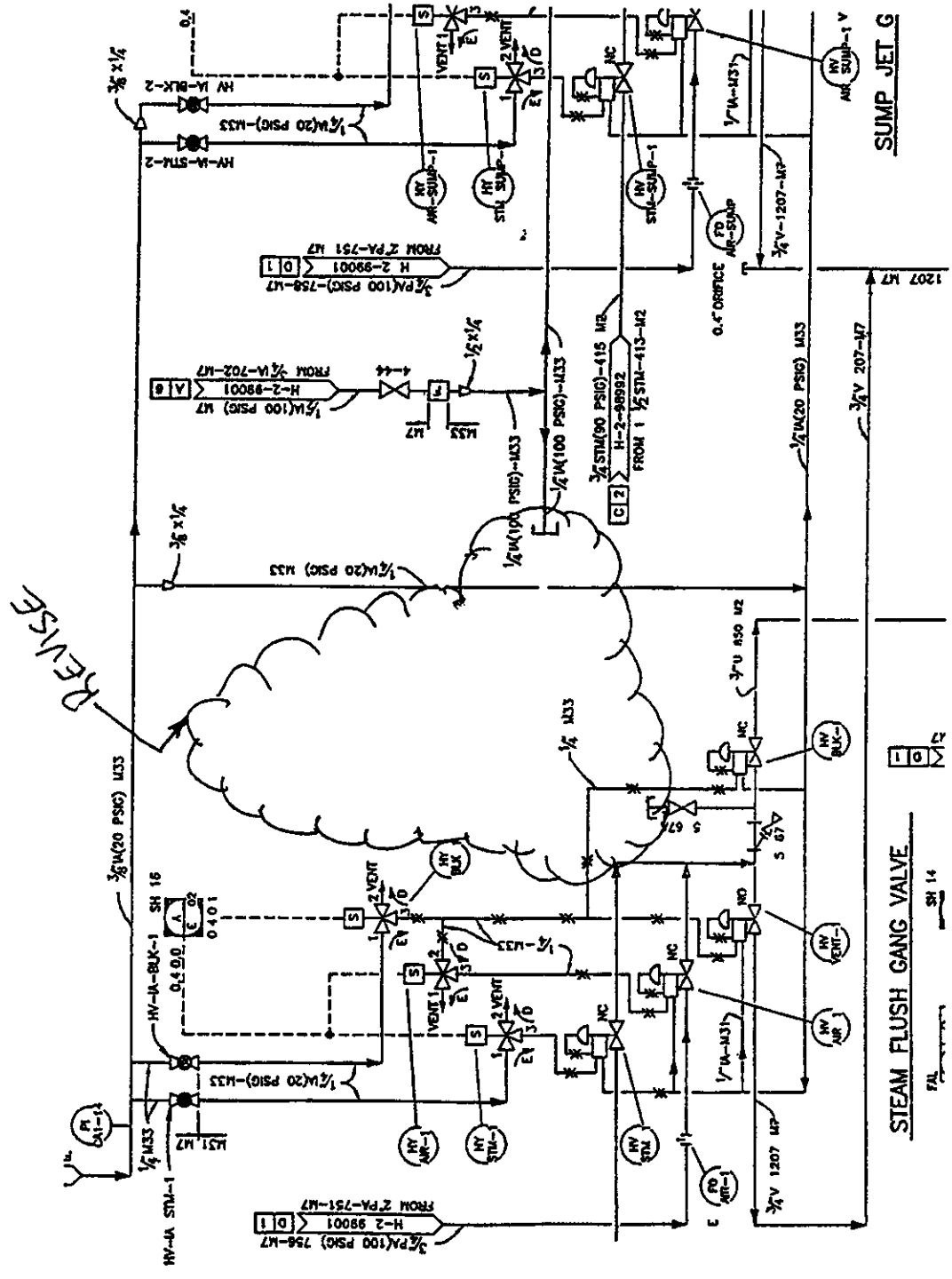


Identification Number LW 98 025	USQ EVALUATION	Page 1 of 3

Title PT CA1 5 Modification

Facility 242 A Evaporator

ECN No 647885 PCA No

Work Pkg No EL 97 00531 Other (Specify)

TITLE PT CA1 5 Modification

Description of the proposed activity/reportable occurrence or PIAB
The pressure transmitter PT CA1 5 is no longer used or required for process operations This instrument was the pressure transmitter for the steam flush of the slurry line and is not working and will be removed The lines to the pressure transmitter will then be capped

Introduction The pressure transmitter was removed for calibration and unable to be calibrated or repaired It was put into service then and not available for use This pressure transmitter will be removed and have the lines leading to it capped The pressure switch and associated equipment will be removed as well The 242A authorization basis does not describe the details of the pressure transmitters nor does it contain any accidents pertaining to the transmitters

Scope This USQ document analyzes the impact of removing the PT CA1 5 pressure transmitter and its associated equipment

Authorization basis The Authorization Basis for the 242 A Evaporator is the *242-A Evaporator Safety Analysis Report* HNF SD WM SAR 023 Rev 3 (SAR) The pressure transmitter is included in Table 5 4 which lists the applications of instrument air at the Evaporator This is the only discussion of the steam flush contained with the SAR

Steam supply and distribution are discussed in section 5 4 5 of the SAR Steam flushing is mentioned but flushing of the slurry line is not specified This section further states that Steam supply is not a Safety Class/Safety Significant system nor is it required to mitigate environmental releases

Compressed air is discussed in Section 5 4 4 of the SAR This section states that Compressed air is not a Safety Class or Safety Significant system nor is it required to mitigate environmental releases

The slurry system is described is section 6 4 1 2 Slurry line flushing is discussed in section 6 4 1 2 9 but only includes flushing with water or a chemical solution from the decontamination header Flushing using steam is not mentioned

Conclusion No DOE approval is necessary This change may be made at contractor discretion

Identification Number LW 98 025	USQ EVALUATION	Page 2 of 3

Title PT CA1 5 Modification

References None outside the Authorization Basis

1 Does the PROPOSED CHANGE test experiment or DISCOVERY increase the probability of occurrence of an accident previously evaluated in the AUTHORIZATION BASIS documentation?
[X] No [ ] Yes/Maybe

BASIS Accident analysis is contained in Section 9 3 of the SAR There are no accidents associated with the pressure transmitters or slurry line flushing at the 242A Evaporator Therefore the proposed change does not increase the probability of an accident previously evaluated in the Authorization basis document

2 Does the PROPOSED CHANGE test experiment or DISCOVERY increase the consequences of an accident previously evaluated in the AUTHORIZATION BASIS documentation?
[X] No [ ] Yes/Maybe

BASIS Accident analysis is contained in Section 9 3 of the SAR There are no accidents associated with the pressure transmitters or slurry line flushing at the 242A Evaporator Therefore the proposed change does not increase the consequences of an accident previously evaluated in the Authorization basis document

3 Does the PROPOSED CHANGE test experiment or DISCOVERY increase the probability of occurrenc of a malfunction of EQUIPMENT IMPORTANT TO SAFETY (ITS EQUIPMENT) previously evaluated in the AUTHORIZATION BASIS documentation?
[X] No [ ] Yes/Maybe

BASIS The Preliminary Hazards Assessment is described in Section 9 2 of the SAR and summarized in Tables 9 4 through 9 8 None of these scenarios rely on slurry line steam flushing or instrumentation associated with steam flushing Therefore the proposed change does not increase the probability of a malfunction of ITS equipment as previously evaluated in the Authorization Basis

4 Does the PROPOSED CHANGE test experiment or DISCOVERY increase the consequences of a malfunction of ITS EQUIPMENT previously evaluated in the AUTHORIZATION BASIS documentation?
[X] No [ ] Yes/Maybe

BASIS The Preliminary Hazards Assessment is described in Section 9 2 of the SAR and summarized in Tables 9 4 through 9 8 None of these scenarios rely on slurry line steam flushing or instrumentation associated with steam flushing Therefore the proposed change will have no effect on the consequences of an ITS equipment malfunction

5 Does the PROPOSED CHANGE test experiment or DISCOVERY create the possibility of an accident of a different type than any previously evaluated in the AUTHORIZATION BASIS documentation?
[X] No [ ] Yes/Maybe

BASIS Steam flushing of the slurry line has not been performed in the recent past and it is unlikely to be required in the future As previously stated neither the steam system nor the compressed air system are required for safety or environmental purposes As the pressure transmitter is an air operated instrument on a steam line removal of this instrument cannot create a new type of accident but rather will decrease the potential for operational upset if the instrument were to malfunction during use

Identification Number LW 98 025	USQ EVALUATION	Page 3 of 3

Title PT CA1 5 Modification

6 Does the PROPOSED CHANGE test experiment or DISCOVERY create the possibility of a malfunction of ITS EQUIPMENT of a different type than any previously evaluated in the AUTHORIZATION BASIS documentation?
[X] No [ ] Yes/Maybe

BASIS Steam flushing of the slurry line has not be performed in the recent past and it is unlikely to be required in the future As previously stated neither the steam system nor the compressed air system are required for safety or environmental purposes As the pressure transmitter is an air operated instrument on a steam line removal of this instrument cannot create a new type of ITS equipment malfunction It will however decrease the potential for operational upset if the instrument were to malfunction during use

7 Does the PROPOSED CHANGE test experiment or DISCOVERY reduce the margin of safety as defined in the basis for any Technical Safety Requirement?
[X] No [ ] Yes/Maybe

BASIS Operational Safety Requirements (OSRs) and their bases sections are specified in Chapter 11 of the SAR The proposed change will not decrease the margin of safety for any OSR as described in its basis There are no OSRs associated with the pressure transmitter or slurry line flushing as defined in the Authorization basis document

8 Does the PROPOSED CHANGE test experiment or DISCOVERY require a new or revised Technical Safety Requirement?
[X] No [ ] Yes/Maybe

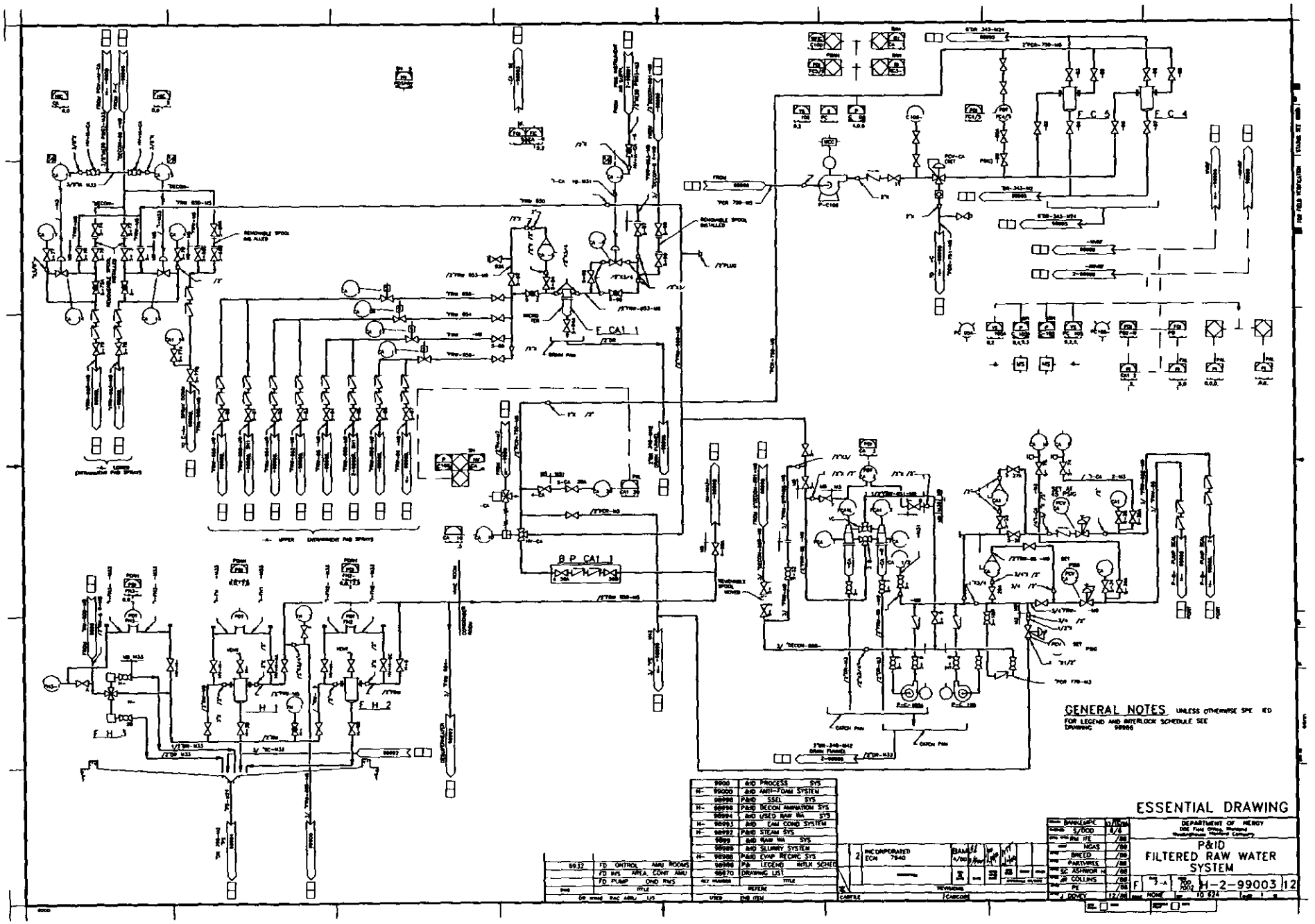
BASIS The removal of the pressure transmitter will have no effect on the OSRs for the 242A Evaporator

USQE #1 TM GALIOTO (Print Name)

Signature Date 6-24-98

USQE #2 MD GUTHRIE (Print Name)

Signature Date 6/24/98


F C 5
F C 4
F CAT 1
B P CAT 1
H 1
F H 2
F H 3
GENERAL NOTES UNLESS OTHERWISE SPECIFIED
FOR LEGEND AND INTERLOCK SCHEDULE SEE DRAWING 99986
ESSENTIAL DRAWING
P&ID
FILTERED RAW WATER SYSTEM
H-2-99003 12

Hanford Facility RCRA Permit Modification Notification Forms
Part III, Chapter 6 and Attachment 36
325 Hazardous Waste Treatment Units

Index

Hanford Facility RCRA Permit Modification Notification Form

Unit	Permit Part & Chapter
325 Hazardous Waste Treatment Units	Part III, Chapter 6 and Attachment 36

Description of Modification

Hanford Facility RCRA Permit Condition III 6 A

III 6 A COMPLIANCE WITH APPROVED PERMIT APPLICATION

The Permittees shall comply with all requirements set forth in Attachment 36 including the Amendments specified in Condition III 6 B Enforceable portions of the application are listed below All subsections figures and tables included in these portions are also enforceable unless stated otherwise

Part A Form 3 Permit Application Revision 4A from Class 1 Modification for quarter ending June 30 2000

Chapter 2 2 Topographic Map Chapter 2 0 non enforceable sections modified in Class 1 Modification for quarter ending December 31 2000

Chapter 3 0 Waste Characteristics from Class 1 Modification for quarter ending December 31 1998

Chapter 4 0 Process Information from Class 1 Modification for quarter ending ~~December 31 2000~~ March 31 2002

Chapter 6 0 Procedures to Prevent Hazards from Class 1 Modification for quarter ending December 31 2000

Chapter 7 0 Contingency Plan from Class 1 Modification for quarter ending June 30 2000

Chapter 8 0 Personnel Training from Class 1 Modification for quarter ending September 30 2001

Chapter 11 0 Closure and Financial Assurance from Class 1 Modification for quarter ending December 31 2000

Chapter 12 0 Reporting and Recordkeeping from Class 1 Modification for quarter ending December 31 1998

Chapter 13 0 Other Relevant Laws from Class 1 Modification for quarter ending December 31 1998

Appendix 3A 325 HWTUs Waste Analysis Plan from Class 1 Modification for quarter ending December Engineering Drawings

Appendix 7A Building Emergency Plan for the 325 HWTUs from Class 1 Modification for quarter ending June 30 2001

Modification Class [1,2,3]	Class 1	Class[1]1	Class 2	Class 3
Please check one of the Classes	X			

Relevant WAC 173 303 830 Appendix I Modification A 1

Enter wording of the modification from WAC 173 303 830, Appendix I citation

A General Permit Provisions

1 Administrative and Informational changes

Submitted by Co Operator	Reviewed by RL Program Office	Reviewed by Ecology	Reviewed by Ecology
AKonen for 3 15 02	RF Christensen 4/1/02		
A K Ikenberry Date	R F Christensen Date	F Jamison Date	L E Ruud Date

[1] Class 1 modifications requiring prior Agency approval

[2] This is only an advanced notification of an intended Class [1]1 2 or 3 modification this should be followed with a formal modification request and consequently implement the required Public Involvement processes when required

[3] If the proposed modification does not match any modification listed in WAC 173 303 830 Appendix I then the proposed modification should automatically be given a Class 3 status This status may be maintained by the Department of Ecology or down graded to [1]1 if appropriate

Hanford Facility RCRA Permit Modification Notification Form

Unit	Permit Part & Chapter
325 Hazardous Waste Treatment Units	Part III Chapter 6 and Attachment 36

Description of Modification

Chapter 4 Section 4 1 4 1

4 1 4 1 Sec d ry C ta me t Sy t m Des g d Operatio f th H d us W t T tm t U t

Th ond ry t nm t syst m f th HWTU has thre primary compo t f rm f re d pproved fl mm bl l q d st g b t th floo f th ooms d th f re w t ta nm t system (F g re 4 1)

~~Mixed and/or d~~ Dangerous wast t rs of 65 l ters or le s s st red Room 520 t l fl mmable sto ge c b ets lo ted torag room that form the northeast corn f th room An dd t l fl mm bl t g b t loc t d be th a sta l s t l ve t l t d hood loc t d l g th th w ll f Room 520 C ta rs ve 65 l te are may be st red a hood loc t d l g th east wall f th m or on the floor of th m t, as noted below The t rs ar m d f t l ss t l the su tabl materi l pe d g th chara ter t f th wa t and are k pt cl d cept wh wast s be g add d withdraw

Dang rous waste c t rs f 65 l ters or less is st red Room 528 steel storage cab net ac o d c w th WAC 173 303 395(1)(a) and th U f rm B ld g Cod (ICBO 1991) Th re are e ght st rage b et fou for flamm bl wast and four for corrosive waste Tw b t (o fl mmabl storage cabi t and rr ve t rage b t) ar loc ted alo g th rth w ll of the room Tw b ts f orros ve wast are l cat d l g th ast w ll Two cab et f fl mm bl wast are al locat d alo g th south w ll F rthe t rag p vid d by fl mm bl b t loc ted beneath ta l ss t l ve t lat d hood o th east w ll f th m Ea h b t s cl arly marked co t g th fl mmabl o c rr waste Flammabl wast b ets are pai t d y llow and rr ve cab ets are pai t d bl

L qu d vastes t conta rs from 65 to 328 l ters (17 to 85 gallons) capacity will be placed within drip pans or simular secondary containment devices Containers from 65 to 328 l ters (17 to 85 gall ns) capac ty holding o ly wastes that do not contain free l quids do not exhibit either the characteristi if ignitabil ty or reactivity as described in WAC 173 303-090(5) o (7) and are t designated as F020 F021 F022 F023 F026 or F027 will be stored in DOT approved drums on the floor within the unit

R ms 520 a d 528 are loc t d o th m floo f the 325 B ld g d ar stru ted of co c et Th t fl rs f both m h ve been eq pped w th a heat sealed ml hem cal re t t polyp pyle e coat g th t rs th e t re floo ar f both m d l ps app o mately 10 t m t p ll f th ts d wall f h ro m Th t d fl o sc p bl f t n ngm o p ll d leaks of liq d m d wast ~~In addition because the floors are not sloped waste containers stored on the floors are elevated or otherwise protected to prevent the container from coming in contact with spilled waste~~

M j sp ll l aks f l q d m d wast fl w t th f e w t c t nm t y t m Th f wat c t m t y t m t ff l tr h l t d te h tra t th oom and th f w t t m tt nk l t d th basem t f th b ld g Th y t m d gn d t ll t th f pp w t th ve t that th t m t p nkl y t m was t vat d Th l t f th tre h h wn F g 4 1

Th floo t h s locat d d th d bl doo s on th w t d f Room 520 and 528 ar pp m t ly 20 t m t w d 46 t m te s de p and 1 91 m t s lo g Th fl t h loc t d d th gl th doo f Room 520 s appro m t ly 20 t m t s w d 46 t m t rs d p and 1 5 met rs l g Th floo tre h l t d d th s gl thw t d o of Room 528 20 t m t rs w d 61 t m t de p and 1 5 m t rs l g Th tre h t d mpl t ly ro th tran of h room th t l q d d t fl w t th gh d rw y Th tr hes are c nstru t d of 14 ga ge tai l ss st l and ar q pp d w th t l gr t All ms are w ld d t t grit T h d the d bl d rs ar q pped with tw dra ns th bott m and trench l t d d gl doors are eq pped w th o e dra to all w l q d to d a fr m th t h thr gh 15 t m ter-d m t carbo teel p p g t th f re w t co tai m t tank

Th f re t t m tt nk loc t d be th R m 520 th bas m t f th 325 B ld g Th t gul tank h d m f 1 65 m t by 2 25 m t rs by 1 92 m t d p ty of 22 710 l t rs Th d and fl f th t nk ar tru ted f ep y t d arbo t l pl t Th t l d s and floo p d pport f th h m l p lyp pyl l Th t nk ur d t the o c t fl f th 325 B ld g basem t w th 1 3-c t m t bolt t 1 8 m t t rval

Th p b l ty f m g mp t bl wast the co t m t y t m m m ed beca th mb f t ope to t m will b l m ted to those p o s (t t p ces st d l d t s) I dd t th ery l ge l m of y f w t fl w w ld d l t w st a d w ld m m th po b l t f d rs t

Modification Class [1 2 3] Please check one of the Classes	Class 1	Class [1]1	Class 2	Class 3
	X			

Relevant WAC 173 303 830 Appendix I Modification A 1

Enter wording of the modification from WAC 173 303 830, Appendix I citation

A General Permit Provisions

1 Administrative and Informational changes

Submitted by Co Operator	Reviewed by RL Program Office	Reviewed by Ecology	Reviewed by Ecology
A K Ikenberry Date	R F Christensen Date	F Jamison Date	L E Ruud Date

[1] Class 1 modifications requiring prior Agency approval

[2] This is only an advanced notification of an intended Class [1]1 2 or 3 modification this should be followed with a formal modification request and consequently implement the required Public Involvement processes when required

[3] If the proposed modification does not match any modification listed in WAC 173 303 830 Appendix I then the proposed modification should automatically be given a Class 3 status This status may be maintained by the Department of Ecology or down graded to [1]1 if appropriate

Index

4 0 CONTENTS

FIGURES

TABLE

APPENDIX

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4 0 PROCESS INFORMATION [D]

This chapter provides a description of waste management equipment treatment processes and storage operations

4 1 CONTAINERS [D 1]

The following sections describe the management of dangerous waste in containers at the 325 HWTUs Container management occurs at both the HWTU and the SAL Both portions of the 325 HWTUs are used to store and treat dangerous waste generated from onsite programs primarily as a result of laboratory analytical activities in the 325 Building and other PNNL facilities Descriptions of the containers used are provided in the sections that follow for the HWTU and SAL

4 1 1 Description of Containers [D 1a]

The following sections describe the types of containers used for dangerous waste storage and treatment in the 325 HWTUs

4 1 1 1 Containers Located in the Hazardous Waste Treatment Unit

Rooms 520 and 528 of the HWTU are used to store and treat dangerous waste generated primarily from laboratory operations 0throughout the 325 Building and the Hanford Facility The containers used to store and treat dangerous waste vary widely from original manufacturer containers to laboratory glassware for sample analysis or to 322 liter containers used to overpack smaller containers Containers used for storage or treatment of dangerous waste are compatible with the waste stored in them Acceptable containers for acidic waste include plastic steel lined with plastic glass and fiberglass containers Acceptable containers for other waste include steel glass fiberglass plastic and steel lined with plastic Table 4 1 provides an example of the types of containers that could be used in the HWTU rooms including the material of construction and the capacity of the container

All containers of dangerous waste are labeled to describe the contents of the container and the major hazards of the waste as required under WAC 173 303 395 Each container is assigned a unique identifying number All containers used for onsite transfer are selected and labeled according to any applicable regulations including 49 CFR as required by WAC 173 303 190

All flammable liquid waste is stored in compatible containers and in Underwriter s Laboratory (UL) listed and Factory Mutual (FM) approved flammable storage Solid chemicals are stored on shelving in specif ically designated areas based on the hazard classification

4 1 1 2 Shielded Analytical Laboratory Containers

The primary function of the SAL is to conduct analysis of samples of waste streams collected at various locations on the Hanford Facility The types of containers used to store dangerous waste in the SAL can vary widely from the original containers to laboratory glassware for sample analysis to 322 liter containers used to overpack smaller containers

The containers used for storage or treatment of dangerous waste are compatible with the waste stored in the containers Acceptable containers for acidic waste include plastic steel lined with plastic glass and fiberglass containers Acceptable containers for other waste include steel glass fiberglass plastic and steel lined with plastic Table 4 1 provides an example of the types of container that could be used in the SAL including the material of construction and the capacity of the container

Rooms 32 200 202 and 203 are used to store dangerous waste in containers The back face of the SAL is typically used to store waste in the larger containers These containers include various types of 208 liter steel containers (lined and unlined) Because of the nature of some dangerous waste being stored at the SAL it is often necessary that these standard 208 liter containers be modified This modification ensures that the containers are specially shielded to reduce the hazard of the radioactive component of the dangerous waste stored in the container and are compliant with the ALARA criteria These specially designed shielded containers are packaged to contain anywhere from 3 79 liters to 53 liters of waste depending on the amount of shielding required The solid waste typically is packed in individual 3 79 liter to 4 73 liter containers before placement in the 208 liter shielded container The shielding is accomplished by surrounding the small containers with concrete lead or other materials to reduce the dose rate produced by the radiological component of the dangerous waste

All containers of dangerous waste are labeled to describe the contents of the container and the major hazards of the waste as required under WAC 173 303 395 Each container is assigned a unique identifying number All containers used for onsite transfer are selected and labeled according to any applicable regulations including 49 CFR are required by WAC 173 303 190

All flammable liquid waste is segregated from any incompatible waste types and packaged in approved containers

4 1 2 Container Management Practices [D 1b]

Management practices and procedures for containers of dangerous waste ensure the safe receipt handling preparation for transfer and transportation of the waste The following sections describe the container management practices used for the HWTU and the SAL Table 4 1 lists the typical containers used in the 325 HWTUs

4 1 2 1 Hazardous Waste Treatment Unit Container Management Practices

Dangerous waste containers are inspected for integrity and adequate seals before being accepted at the HWTU Waste received for storage and treatment from outside Rooms 520 and 528 is either picked up by HWTU personnel or moved to Rooms 520 and 528 in containers suitable for the waste Depending on the container weight size or number of containers to be moved container(s) of dangerous waste are hand carried or moved on a platform or handcart as appropriate to Rooms 520 or 528 325 HWTUs staff moves the dangerous containers in accordance with 325 HWTUs collection procedures that address safety and hazard consideration These procedures cover various waste types (transuranic (TRU) and low level) and transportation modes 325 HWTUs staff does not perform the operations covered by a procedure until they are formally trained on the procedure

Containers in poor condition or inadequate for storage (e g damaged not intact or not securely sealed to prevent leakage) are not accepted at Rooms 520 and 528 Examples of acceptable packaging include laboratory reagent bottles U S Department of Transportation approved containers spray cans sealed ampules paint cans leaking containers that have been overpacked etc Unit operations personnel have the authority to determine whether a container is in poor condition or inadequate for storage using the criteria of WAC 173 303 190 and to use professional judgment to determine whether the packaging could leak during handling storage and/or treatment Container stacking is not performed

Inspection of Containers A system of daily weekly monthly and yearly inspections is in place to ensure container integrity and to check for proper storage location prevent capacity overrun etc Inspections are detailed in Chapter 6 0 Section 6 2 Containers are inspected for integrity before acceptance at or

transport to the HWTU Containers found to be in poor condition or inadequate for storage are not accepted

Container Handling All HWTU staff is instructed in proper container handling and spill prevention safeguards as part of their training (Chapter 8 0) Containers are kept closed except when adding or removing waste in accordance with WAC 173 303 630(5)a) All personnel are trained and all operations are conducted to ensure that containers are not opened handled or stored in a manner that would cause the container to leak or rupture All flammable cabinets containing dangerous waste are maintained with a minimum of 76 centimeters of aisle space in front of the doors The walk in fume hood containing the 208 liter containers is designed to hold four 208 liter containers and has over 76 centimeters of aisle space the containers are not stacked in the hood Waste handling operations can be conducted only when two or more persons are present in the unit or when the personnel present have immediate access to a communication device such as a telephone or hand held radio

4 1 2 2 Shielded Analytical Laboratory Container Management Practices

Containers are not opened handled or stored in a manner that would cause the containers to leak or rupture Containers will remain closed except when sampling adding or removing waste or when analysis or treatment of the waste is ongoing Containers of incompatible waste are segregated in the storage areas In cell containers will be stacked no more than four high and labels will not be obscured

Inspection of Containers A system of daily weekly monthly and yearly inspections is in place to ensure container integrity and to check for proper storage location prevent capacity overrun etc Inspections are detailed in Chapter 6 0 Section 6 2 Containers are inspected for integrity before acceptance at or transport to the SAL Containers found to be in poor condition or inadequate for storage are not accepted

Container Handling All personnel are instructed in proper container handling safeguards as part of their training (Chapter 8 0) Containers are kept closed except when adding or removing waste in accordance with WAC 173 303 630(5)(a)

All container handling in the hot cells must be performed remotely with manipulators Waste samples managed in the SAL enter the cells through rotating transfer wheels located in the back walls of cells 1 2 and 6 and through a 17 8 centimeter borehole in the back wall of cell 1 Waste samples are moved into and out of the cells at these locations according to approved procedures that vary with the radioactivity level of the sample After analysis of the sample and necessary confirmation of results compatible solid waste samples are consolidated into appropriate size containers often referred to as paint cans and usually stored in cell 1 However any of the cells can be used for storage of waste during operations

After evaluation for treatment and the subsequent treatment liquid waste is either transferred to the SAL tank (discussed in Section 4 2) or solidified and repackaged into shielded 208 liter containers and stored in the back face area of the SAL Waste generated outside of the hot cells is placed into appropriately sized containers and stored until packaged for shipment or transfer Waste handling operations are conducted outside of the cells only when a minimum of two persons are present in the unit or when the personnel present has immediate access to a communication device such as a telephone or hand held radio

4 1 3 Container Labeling [D 1c] 1 3

Once the material has been designated as a dangerous waste all containers are marked and/or labeled to describe the content of the container as required by WAC 173 303 395 Containers also are marked with a unique identifying number assigned by the generating unit All containers used for transfer of dangerous waste are prepared for transport in accordance with WAC 173 303 190

4 1 4 Containment Requirements for Storing Containers [D 1d and D 1d(1)(a)]

A description of secondary containment system design and operation is provided for the HWTU and SAL in this section

4 1 4 1 Secondary Containment System Design and Operation for the Hazardous Waste Treatment Unit

The secondary containment system for the HWTU has three primary components uniform fire code approved flammable liquid storage cabinets the floor of the rooms and the fire water containment system (Figure 4 1)

Dangerous waste in containers of 65 liters or less is stored in Room 520 in steel flammable storage cabinets located in a storage room that forms the northeast corner of the room An additional flammable storage cabinet is located beneath a stainless steel ventilated hood located along the south wall of Room 520 Containers over 65 liters may be stored in a hood located along the east wall of the room or on the floor of the unit as noted below The containers are made of stainless steel or other suitable material depending on the characteristics of the waste and are kept closed except when waste is being added or withdrawn

Dangerous waste in containers of 65 liters or less is stored in Room 528 steel storage cabinets in accordance with WAC 173 303 395(1)(a) and the Uniform Building Code (ICBO 1991) There are eight storage cabinets four for flammable waste and four for corrosive waste Two cabinets (one flammable storage cabinet and one corrosive storage cabinet) are located along the north wall of the room Two cabinets for corrosive waste are located along the east wall Two cabinets for flammable waste are also located along the south wall Further storage is provided by a flammable cabinet located beneath a stainless steel ventilated hood on the east wall of the room Each cabinet is clearly marked as containing either flammable or corrosive waste Flammable waste cabinets are painted yellow and corrosive cabinets are painted blue

Liquid wastes in containers from 65 to 328 liters (17 to 85 gallons) capacity will be placed within drip pans or similar secondary containment devices Containers from 65 to 328 liters (17 to 85 gallons) capacity holding only wastes that do not contain free liquids do not exhibit either the characteristic if ignitability or reactivity as described in WAC 173 303 090(5) or (7) and are not designated as F020 F021 F022 F023 F026 or F027 will be stored in DOT approved drums on the floor within the unit

Rooms 520 and 528 are located on the main floor of the 325 Building and are constructed of concrete The concrete floors of both rooms have been equipped with a heat sealed seamless chemical resistant polypropylene coating that covers the entire floor area of both rooms and laps approximately 10 centi meters up all of the outside walls of each room The coated floor is capable of containing minor spills and leaks of liquid mixed waste

Major spills or leaks of liquid mixed waste flow into the fire water containment system The fire water containment system consists of floor trenches located at each entrance to the rooms and the fire water containment tank located in the basement of the building The system is designed to collect the fire suppression water in the event that the automatic sprinkler system was activated The location of the trenches is shown in Figure 4 1

The floor trenches located under the double doors on the west side of Rooms 520 and 528 are approximately 20 centimeters wide 46 centimeters deep and 1 91 meters long The floor trench located under the single south door of Room 520 is approximately 20 centimeters wide 46 centimeters deep and 1 5 meters long The floor trench located under the single southwest door of Room 528 is 20 centimeters

wide 61 centimeters deep and 1 5 meters long The trenches extend completely across the entrance of each room so that liquids do not flow out through a doorway The trenches are constructed of 14 gauge stainless steel and are equipped with a steel grate cover All seams are welded to ensure integrity Trenches under the double doors are equipped with two drains in the bottom and trenches located under single doors are equipped with one drain to allow liquid to drain from the trench through 15 centimeter diameter carbon steel piping to the fire water containment tank

The fire water containment tank is located beneath Room 520 in the basement of the 325 Building The rectangular tank has dimensions of 1 65 meters by 2 25 meters by 1 92 meters and a capacity of 22 710 liters The sides and floor of the tank are constructed of epoxy coated carbon steel plate The steel sides and floor provide support for the chemical resistant polypropylene liner The tank is secured to the concrete floor of the 325 Building basement with 1 3 centimeter bolts at 1 82 meter intervals

The possibility of mixing incompatible waste in the containment system is minimized because the number of containers open at one time will be limited to those in process (waste not in process is stored in closed containers) In addition the very large volume of any firewater flow would dilute waste and would minimize the possibility of adverse reactions

4 1 4 2 Secondary Containment System Design and Operation for the Shielded Analytical Laboratory

The secondary containment in the SAL is divided into three systems the six hot cells the front face and the back face Figure 4 2 provides a first floor plan view depicting these three areas

The secondary containment for the six hot cells consists of the stainless steel base of the cell and a continuous trough located on the east side of the cells The hot cell secondary containment system is shown in Figure 4 2 The base and trough can collect leaks and spills generated during analytical chem istry operations The stainless steel bases are approximately 0 55 square meter The troughs are approximately 15 2 centimeters wide 7 6 centimeters deep and extend across the entire 1 82 meter width of each cell The troughs are equipped with a stainless steel grate cover The leaks and spills are drained by gravity through drains in the bottom of the trough and through stainless steel piping to the SAL tank located in the basement (Room 32) The SAL tank is constructed of stainless steel and has a capacity of 1 218 liters Design and operating specifications are provided in Section 4 2

The secondary containment system for the back face of the SAL consists of shielded 208 liter containers and plastic containers Solid mixed waste is packaged in containers (e g paint cans bottles bags) before removal from the hot cells Once removed from the hot cells the containers are placed into specially designed shielded 208 liter containers to provide secondary containment Containers of liquid waste are placed into plastic containers that provide secondary containment and prevent spilled liquids from contacting other waste containers Some containers are placed in shielded cubicles in Room 202 depending on container dose rates The location of the cubicles is shown in Figure 4 2

The secondary containment system for the front face of the SAL which is minimally used to store mixed waste is similar to the system for the back face Containers holding liquid and solid mixed waste are placed into containers to provide secondary containment the primary area for mixed waste storage is the fume hood

4 1 5 Structural Integrity of Base [D 1d(1)(b)

A description of the requirements for base or liner to contain liquid is provided in the following sections for the HWTU and the SAL

4 1 5 1 Requirements for Base or Liner to Contain Liquids in the Hazardous Waste Treatment Unit

The floors in Rooms 520 and 528 have been equipped with the chemical resistant polypropylene coating All seams in the coating were finished by heat welding to ensure the integrity of the coating The coating currently is free of cracks and gaps and will be maintained that way throughout the life of the HWTU The condition of the floor is inspected weekly as part of the inspection program (Chapter 6 0) Floor coating assessment is carried out whenever the floor coating is observed to have been chipped bubbled up scraped or otherwise damaged in a manner that would impact the ability of the coating to contain spilled materials Minor nicks and small chips resulting from normal operations are repaired periodically

The floor coating holds any spilled liquid until the liquid is cleaned up or enters the drains in each room Once the liquid has entered the drains the liquid drains into the fire water containment tank in the basement where the liquid is stored pending chemical analysis and treatment and/or disposal

The base of the HWTU floors consists of 14 2 centimeter reinforced poured concrete slabs with no cracks or gaps The concrete is mixed in accordance with ASTM 094 Section 5 3 Alternate 2 and is finished with a smooth troweled surface The concrete base has a load capacity of 976 kilograms per square meter

The floor trenches that prevent liquids from migrating from the HWTU rooms are constructed of 14 gauge stainless steel All seams are welded and the connections with the drains are tight The stainless steel is compatible with and resistant to the liquid mixed waste managed in the HWTU

4 1 5 2 Requirements for Base or Liner to Contain Liquids in the Shielded Analytical Laboratory

The base currently is free of cracks and gaps and will be maintained that way throughout the life of the SAL The base of the floor for the six hot cells consists of a 0 48 centimeter layer of stainless steel formed on top of poured concrete The stainless steel base is compatible with most of the waste generated in the hot cells The exceptions are waste containing hydrofluoric acid and high concentrations of hydrochloric acids This waste is stored in individual secondary containment to prevent contact of the waste with the stainless steel in the event that a primary waste container was to fail Because the volumes of waste generated and stored are small and because the hot cell floors are not sloped any waste spilled during waste handling activities probably would remain in a localized area and be cleaned up expeditiously to ensure that no damage occurs to the stainless steel As was previously discussed a stainless steel tank provides the secondary containment system for the six cells Liner and base requirements for the SAL tank are discussed in Section 4 2

The bases of the back face and front face of the SAL consist of a 15 2 centimeter reinforced poured concrete slabs with no cracks or gaps The concrete base has a load capacity of 976 kilograms per square meter The base in Room 201 is topped with a seamless chemical resistant polypropylene coating Rooms 202 and 203 are topped with epoxy based paint In Room 200 the concrete slab is painted and there is a trap door in the painted floor of Room 200 that enables transfer of equipment between Rooms 200 and 32 The airflow between these rooms is from Room 200 to Room 32 due to positive air pressure in Room 200

4 1 6 Containment System Drainage

A description of the containment system drainage for the HWTU and SAL is provided in this section

4 1 6 1 Containment System Drainage for the Hazardous Waste Treatment Unit

The floors in Rooms 520 and 528 are not sloped Small spills of liquid probably will remain in a localized area until the spills are cleaned up All containers of dangerous waste are stored either in drums on shelves within open faced hoods or within flammable or corrosives storage cabinets to prevent the containers from contacting spilled materials Large spills of liquid material would spread laterally across the flat surface of the floor The flow of the spilled liquid would be stopped by an outside wall(s) of the room or by one of the trenches protecting the entrances to the room The lower 10 centimeters of the outside walls of the rooms are covered with the same chemical resistant coating as that on the floor to prevent spills from migrating throughout the walls

The floor drains across each exit drain spill to an emergency firewater containment tank (22 710 liter capacity) located in the basement of the 325 Building The tank captures all drained liquid where the liquid is stored until sampling and analysis indicates a proper treatment and/or disposal method

4 1 6 2 Containment System Drainage for the Shielded Analytical Laboratory

The stainless steel base of the hot cell is not sloped Because of the small volume of waste that is handled small spills probably would remain in a localized area until the spills are cleaned up As a result all containers of liquid mixed waste are stored within secondary containment to prevent spilled liquids from contacting the containers Large spills that occur within the SAL hot cells flow to the stainless steel trough at the front of each cell which gravity drains into the SAL tank (TK 1 Room 32)

The bases of the front and back faces are not sloped Containers in these areas are stored within secondary containment and off the base surface to prevent spilled liquids from contacting the containers

4 1 7 Containment System Capacity [D 1d(1)(c)

A description of the containment system capacity for the HWTU and SAL is provided in the following sections

4 1 7 1 Containment System Capacity for the Hazardous Waste Treatment Unit

The maximum combined total volume of all containers of dangerous waste stored in both HWTU rooms is 10 000 liters The largest mixed waste storage container is a 322 liter container The fire water containment tank provides secondary containment for both HWTU rooms The capacity of the fire water containment tank is 22 710 liters therefore the containment system is more than adequate to contain either 10 percent of the total volume of waste (2 840 liters) or the entire volume of the largest container (322 liters)

4 1 7 2 Containment System Capacity for the Shielded Analytical Laboratory

The largest container of liquid waste to be stored in the hot cells is a 7 6 liter container

The SAL tank is considered to be the secondary containment for the hot cells The largest quantity of liquid that could be stored in the hot cells while maintaining adequate (10 percent of total volume) secondary containment would be 12 491 liters The total amount of liquid to be stored in the hot cells is governed by the area constraint of the cells Typically the largest amount of liquid waste to be stored in the hot cells at one time is 75 8 liters

Liquid waste stored in Room 201 is stored in the fume hood The waste is stored in glass or plastic bottles that are each placed in individual plastic containers of a size that is sufficient to hold all of the

contents of the inner vessel The quantity of liquid waste stored in the hood is governed by the area constraint in the hood Similarly liquid waste stored in Room 202 is stored in glass or plastic bottles that are each placed in individual secondary containment

The floors of the front face and back face are constructed of concrete The rear face floor in Rooms 202 and 203 is covered with epoxy paint Floor drains flow to the retention process sewer (RPS) system which has a diverter triggered by a radiation monitor that diverts radioactive liquids detected in the RPS line to the RLWS Because of the small quantities of liquid stored in the front face and back face any spill that is not contained by the plastic overpack probably would remain on the floor in a localized area until cleaned Any liquid that managed to flow to the room drains would be conveyed by gravity to the RPS system or depending on radionuclide content to the RLWS and into the RLWT

4 1 8 Control of run on [D 1d(1)(d)

Run on control for the HWTU and SAL is described in the following sections

4 1 8 1 Control of run on for the Hazardous Waste Treatment Unit

The 325 Building mitigates the possibility of run on for the HWTU The level of the main floor is approximately 1 52 meters above the level of the ground surface around the building

4 1 8 2 Control of run on for the Shielded Analytical Lab

The 325 Building mitigates the possibility of run on for the SAL The level of the main floor is approximately 1 52 meters above the level of the ground surface around the building

4 1 9 Removal of Liquids from Containment System [D 1d(2)]

The removal of liquids from the containment system for the HWTU and SAL is described in the following sections

4 1 9 1 Removal of Liquids from the Hazardous Waste Treatment Unit Containment System

On discovery of liquid accumulation in the containment resulting from a spill or other release the Building Emergency Director (BED) must be contacted in accordance with the contingency plan (Chapter 7 0) The BED may determine that the contingency plan should be implemented If the incident is minor and if the BED approves removal of the liquid commences immediately following a safety evaluation Appropriate protective clothing and respiratory protection will be worn during removal activities an industrial hygienist could be contacted to determine appropriate personal protection requirements and any other safety requirements that might be required such as chemical testing or air monitoring In addition ventilation of the spill area might be performed if it is determined to be safe and if appropriate monitoring of the air discharge(s) is performed

Liquid spills are contained within the Room 520 or Room 528 floor or within the fire water containment tank Localized spills of liquids to the floor of the HWTU rooms are absorbed with an appropriate absorbent (after the appropriate chemical reaction has occurred to neutralize reactivity in the case of reactive waste or after neutralization has occurred in the case of corrosive materials) The absorbent material is recovered and placed in an appropriate container The floor cabinets and any other impacted containers can be cleaned by dry rags soap and water or a compatible solvent if necessary to remove external contamination Contaminated rags and other cleanup material are disposed of in an appropriate manner If spilled materials in the HWTU reach the firewater containment tank the material will be held in place until chemical analysis indicates an appropriate treatment and/or disposal method The waste

analysis procedures and analytical methods used to designate the spilled materials are described in the waste analysis plan Appendix 3A The tank is designed to allow easy access for material sampling Depending on the results of the analysis the collected spill material is pumped to the RLWS or pumped to the RPS

4 1 9 2 Removal of Liquids from the Shielded Analytical Laboratory Containment System

The removal of liquid from the SAL tank which provides the secondary containment for the six hot cells is discussed in Section 4 2 The tank will be emptied after the accumulated waste is designated

On discovery of liquid accumulation in the back or front face containment resulting from a spill or other release the BED must be contacted in accordance with the contingency plan (Chapter 7 0) The BED could determine that the contingency plan should be implemented If the incident is minor and if the BED approves removal of the liquid commences immediately following a safety evaluation Appropriate protective clothing and respiratory protection will be worn during removal activities an industrial hygienist could be contacted to determine appropriate personal protection requirements and any other safety requirements that might be required such as chemical testing or air monitoring In addition ventilation of the spill area could be performed if it is determined to be safe and if appropriate monitoring of the air discharge(s) is performed

Localized spills of liquids to the floor of the SAL will be absorbed with an appropriate absorbent (after the appropriate chemical reaction to neutralize reactivity has occurred in the case of reactive waste or after neutralization has occurred in the case of corrosive materials) The absorbent material will be recovered and placed in an appropriate container The floor cabinets and any other impacted containers can be cleaned by dry rags soap and water or a compatible solvent if necessary to remove external con tamination Contaminated rags and other cleanup material will be disposed of in accordance with applicable regulations and PNNL internal waste management procedures

4 1 10 Management of Ignitable and Reactive Waste in Containers [D 1f(1) and D 1f(2)]

Management of ignitable and reactive waste in containers within the HWTU and SAL is described in the following sections

4 1 10 1 Management of Ignitable and Reactive Waste in Containers in the Hazardous Waste Treatment Units

Ignitable and reactive waste are stored in compliance with Article 79 Regulations for Flammable and Combustible Liquids (ICBO 1997) Containers of ignitable and reactive waste are stored in individual flammable storage cabinets within the HWTUs

4 1 10 2 Management of Ignitable and Reactive Waste in Containers in the Shielded Analytical Laboratory

Ignitable and reactive waste are stored in compliance with Article 79 Regulations for Flammable and Combustible Liquids (ICBO 1997) Containers of ignitable and reactive waste are stored in individual flammable storage cabinets within the SAL

4 1 11 Management of Incompatible Waste in Containers [D 1f(3)]

The prevention of reaction of ignitable reactive and incompatible waste in containers for the 325 HWTUs is discussed in the following sections

4 1 11 1 Management of Incompatible Waste in Containers at the Hazardous Waste Treatment Unit

Containers of ignitable and reactive waste are stored in segregated flammable storage cabinets Chapter 6 0 Section 6 5 2 describes the methods used to determine the compatibility of dangerous waste so that incompatible waste is not stored together Incompatible waste is never placed in the same container or in unwashed containers that previously held incompatible waste Operations are conducted such that extreme heat or pressure fire or explosions or violent reactions do not occur uncontrolled toxic mists fumes dust or gases in sufficient quantities to threaten human health or the environment are not produced uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosion are not produced and damage to the container does not occur Information on the hazard classification of waste accepted by the HWTU is documented by the generating unit which is carefully reviewed by HWTU personnel before waste acceptance Mixing of incompatible waste is prevented through waste segregation and storage As the containers received in the HWTU usually are smaller than 19 liters the most common segregation is performed by storage of incompatible hazard classes in separate chemical storage cabinets Guidance for the segregation is provided in Chapter 6 0 Section 6 5 2

Minimum aisle space is maintained according to the Uniform Fire Code to separate incompatible waste The possibility of adverse reaction is minimized (Chapter 6 0 Sections 6 6 and 6 7 for methods used to prevent source of ignition)

4 1 11 2 Management of Incompatible Waste in Containers at the Shielded Analytical Laboratory

Incompatible waste in the SAL hot cells is managed by placing primary containers into a second container or tray capable of managing any leak or spilled material Incompatible waste is never placed in the same container or in an unwashed container that previously held incompatible waste

Treatment operations are conducted with minor amounts of waste to ensure that extreme heat or pressure fire or explosive or violent reactions do not occur Potential releases would be controlled by the ventilation system that exhausts through two high efficiency particulate air (HEPA) filters set in series and due to the limited amount of waste in the SAL These HEPA filters are part of the building exhaust system which is maintained and inspected routinely in accordance with PNNL preventive maintenance standards Radioactive and nonradioactive emissions from the 325 Building stack and control devices for those emissions are regulated by the Washington State Department of Health pursuant to Chapter 246 247 WAC and the Washington State Department of Ecology (Ecology) pursuant to Chapters 173-400 173-401 and 173-460 WAC respectively Air pressure barriers for containment control are achieved by supplying air from areas of least contamination (i e offices) to areas of higher contamination (i e cells) These systems ensure proper emission flow through the HEPA filters

Because waste normally is treated in the SAL hot cells human exposure to the remote potential of mixing incompatible waste or reactive waste is minimal Waste generated and treated within the SAL hot cells is stored within separate secondary containers which eliminates the potential for combining incompatible waste Waste stored in the front or back face of the SAL is packaged by hazard classes for transfer or is segregated in separate secondary containment

4 2 TANK SYSTEMS

The following sections describe the management of dangerous waste in the 325 tank systems Each tank system consists of the tank associated piping valves and pumps and secondary containment The first tank system is located in Room 32 of the SAL and is used to collect liquid waste generated from the analytical laboratory operations This SAL tank system is described in Section 4 2 1 The second tank

system is the RLWT system This tank system is used to collect liquid waste discharged to the RLWS prior to being transferred to the DST System The RLWS load out tank system will be operated as described in Section 4 2 2

4 2 1 Shielded Analytical Laboratory Tank System

The SAL is an analytical chemistry laboratory used primarily to prepare and analyze samples of dangerous waste streams for waste characterization This work is conducted in six inter connected hot cells that form the nucleus of the SAL Liquid waste generated during these operations is collected treated if necessary and drained from the hot cells to the SAL tank located in Room 32 of the basement directly below the hot cells A stainless steel trough 15 2 centimeters wide by 7 62 centimeters deep traverses the front of all six hot cells in which solution is poured The trough is equipped with stainless steel grating to capture solids during solution pour The trough collects any liquid waste poured from analytical chemistry operations mixed waste treatment operations other chemical and mixed waste stored in the hot cells and spills or leaks The liquid waste is transferred through a common stainless steel pipeline that drains into the SAL tank The waste is batch transferred from the SAL tank to the radioactive liquid waste system and into the RLWT The SAL tank volume is 1 218 liters and has a throughput of 80 000 liters per year

4 2 1 1 Design Installation, and Assessment of Tank Systems [D 2a]

The following sections discuss the design and installation of the SAL tank and provide information on the integrity assessment

4 2 1 1 1 Design Requirements [D 2a(1)]

Waste stored in the SAL tank has a pH between 7 and 12 The tank is constructed of 316L stainless steel This material is compatible with any of the dangerous waste that is discharged to the tank All waste is treated or reacted before introduction into the tank to meet RLWS waste acceptance criteria

The tank system design has been reviewed by an independent qualified registered professional engineer to verify that the strength of the material is adequate and that it can withstand the stress of daily operation The professional engineer evaluation is included in the tank integrity assessment

The SAL tank is a vertical double shell tank supported by 3 legs and stands approximately 1 7 meters above the ground The top head is a 0 95 centimeter thick flat stainless steel plate Both bottom heads are flanged and dished heads (torispherical) and the bottom height is 10 2 centimeters above ground The inner shell is 107 centimeters outside diameter the outer shell is 114 centimeters outside diameter and each shell is 0 8 centimeter thick stainless steel plate The tank is located inside a containment pan that has a 203 centimeter diameter and is 51 centimeters high the total volume of the pan is 1 648 liters The pan provides for secondary containment of leaks from the tank piping and ancillary equipment and instruments located above the tank Flanged and threaded connections are located within the containment boundary of the pan to capture any leaks that might occur from these connections Outside the containment area all connections are welded There are no outlets drainage or otherwise on the bottom or sides of the tank Appendix 4A contains engineering drawings

Solution enters the tank through a gravity flow welded drain line piped from the hot cells The SAL sources that tie into this drainpipe include the hot cells sink drain hood drain via the sink drain and floor drain The cup sink drain and hood drain line is sealed off and is not in use The drain line also functions as the tank vent that is exhausted by the hot cell exhaust system Waste solution is pumped from the SAL tank to the RLWS by either a transfer gear pump or a water jet both of which are located on top of the tank Both the transfer pump and jet suction lines drop down vertically through the top head to the

bottom head and are bent to the center of the tank to minimize the remaining liquid heel when transferring the liquid to the RLWS The transfer pump is a gear pump with 30 liter per minute capacity at 9 meter water head with 1 5 meters suction head A flow indicator/totalizer is located on the upstream process water line to be used to verify process water flow during water jet transfer operations A second smaller sample pump also is located above the tank The sample pump provides for solution transfer to the sample station located just north of the tank system The operators draw a sample at the ventilated sample hood by opening a small sample valve The sample pump is a gear pump with 3 8 liter per minute capacity at 1 5 meter water head with 1 5 meters suction head Both gear pumps have magnetic drives to avoid shaft leakage The discharge piping from each pump has a pressure relief valve installed to protect the gear pumps The discharge piping from the pressure relief valve is piped back into the tank to contain the solution A mixer is located on top of the SAL tank to provide agitation of the contents for sampling and washout purposes Process water also is provided to the tank system for cleanout of the tank and associated piping

The SAL tank is located in a controlled access room and is monitored from two operating panels The smaller sample panel is located next to the SAL tank and the second main control panel is located in Room 201 the main operating gallery The sample panel provides control for activities related to pulling a sample such as activating the sample pump and controlling process water and monitoring the liquid level of the tank The main control panel provides the operators with the ability to monitor and control the entire SAL tank system The main control panel provides level indication high and high high level annunciation and contains switches for controlling pumps agitators valves etc The SAL tank is instrumented with three types of level monitoring devices Two devices are wired into the annunciator at the main control panel to provide high level alarms and one high level alarm annunciates at the annunciator board in the control room on the third floor This control room is staffed 24 hours a day 7 days a week If a high alarm situation should occur after normal working hours operations personnel would be notified immediately by the alarm and would take corrective action according to procedure The SAL tank system normally is operated on the day shift Personnel occupy the main operating gallery in Room 201 where the personnel would be alerted to off normal conditions on the main control panel A high level alarm also would de energize the process water solenoid valves to the closed position on three water lines into the hot cells and on the process water lines to the SAL tank The containment pan contains a conductivity element that alarms at the main control panel should solution be detected in the pan Operating procedures require that inspections of the entire system be made daily when in use (Chapter 6 0)

4 2 1 1 2 Integrity Assessments [D 2a(2) and D 2a(3)]

An independent qualified registered professional engineer s tank integrity certification has been completed and will be submitted as a separate document

4 2 1 2 Secondary Containment and Release Detection for Tank Systems

This section describes the secondary containment systems and leak detection systems installed in the SAL

4 2 1 2 1 Requirements for Tank Systems [D 2b(1) D 2b(2)(b) and D 2b(2)(c)]

The secondary containment system for the SAL Tank in Room 32 consists of two components (1) the SAL tank is a double walled vessel and the outer tank provides secondary containment for the inner tank and (2) a pan has been installed under the tank to provide secondary containment for the pumps valves and flanges located on the top of the tank The pan also provides tertiary containment for the tank

The existing drainpipe from the hot cells to the SAL tank is a single walled 5 1 centimeter welded stainless steel pipe This piping is visually inspected for leaks on a daily basis when the tank system is in use by means of a remote video system Flanges in this piping and ancillary equipment are located so that secondary containment is provided by the SAL tank secondary containment pan For the existing RLWS the transfer piping from the SAL tank to the RLWT is single walled welded stainless steel pipe from the tank to the 325 Building boundary and double walled stainless steel pipe from the RLWS tank to the cask loading station The RLWS system will utilize the single walled welded stainless steel pipe from the SAL tank to the RLWS tank and a new double walled stainless steel pipe will be used to transfer waste from the RLWS tank to the truck lock New double walled piping will also be installed to extend the drain line from Room 32 to the RLWS tank Refer to Figure 2 3b for a schematic of the modified RLWS tank system The welded single walled transfer piping is visually inspected for leaks within 24 hours of a transfer The 325 Building provides additional containment The basement floors are concrete and any liquid release remains in the immediate area until cleanup The openings to the drains in the basement are elevated 10 2 centimeters above the floor thus any spill would remain in the basement until enough liquid collects to fill the entire basement to a 10 2 centimeter depth The SAL tank can hold a maximum of 1 218 liters and the entire contents of the SAL tank would fill an area of only 3 5 meters by 3 5 meters to a depth of 10 2 centimeters Because the basement is larger than 3 5 meters square the liquid from the SAL tank would not enter a drain opening Details of the design construction and operation of the secondary containment system are described in the following sections

4 2 1 2 2 Requirements for Secondary Containment and Leak Detection

The secondary containment has been designed to prevent any migration of waste or accumulated liquid from the tank system to the soil groundwater or surface water The secondary containment system also can detect and collect releases of accumulated liquids A zoom color television camera surveillance system allows for tank ancillary equipment and general Room 32 viewing The camera located in Room 32 is equipped with auxiliary lighting and mounted on a remote controlled pan and tilt head The color monitor and camera controls are housed in a dedicated cabinet in Room 527 or 527A The HWTU will have the option of either keeping the camera/monitor controls in Room 527 527A or moving it to another location for operational flexibility By maintaining operational flexibility of where the camera controls are located the HWTU can meet ALARA (As Low As Reasonably Achievable) requirements and minimize the expense of added HWTU training requirements

The following is the system description

Materials of construction The tank and components are constructed of 316L stainless steel this material is compatible with the aqueous waste being discharged to the tank The waste has a pH between 7 and 12

Strength of materials The system design has been reviewed by an independent qualified registered professional engineer to verify that the strength of materials is adequate and that the tank can withstand the stress of daily operation (SAIC 1996) Also pressure relief valves are installed in each line exiting the SAL tank In the event that there is a blockage in the pipe or tubing pressure will not build up in the lines The pressure relief valves are set to 30 psi which is well below the design strength of stainless steel pipe and tubing Waste drains back into the SAL tank when a pressure relief valve opens

Strength of foundation The system design has been reviewed by an independent qualified registered professional engineer to verify that the strength of the tank mounting and foundation is adequate to withstand the design basis earthquake (DBE) This ensures that the foundation is capable of providing support to the tank and will resist settlement compression or uplift

Leak detection system description The SAL tank is double walled and a conductivity probe is installed in the annulus to detect any leak of liquid from the primary containment If liquid is detected by the probe alarms are sounded immediately in a local control panel located in Room 32 and in the main control room

A pan installed beneath the SAL tank provides tertiary containment The containment pan has a conductivity element that alarms at the main control panel if the presence of liquid in the pan is detected The containment pan has an 203 centimeter diameter and a 51 centimeter height with a containment capacity of 1 648 liters The containment pan will easily hold the total capacity of the 1 218 liter SAL tank plus any potential process water that might be released

Removal of liquids from secondary containment The tank secondary containment the outer shell of the double walled vessel is designed to contain a liquid leak from the inner vessel until provisions can be made to remove the liquid The liquid might not be removed within 24 hours because of the coordination that must take place in the 325 Building A tube is installed in the annulus that extends to the bottom and is capped at the top of the tank If liquid were detected in the annulus the liquid could be removed by connecting a tube between the capped fitting and the transfer pump which would pump the liquid into the RLWS transfer line

A delay of greater than 24 hours in removing the liquid from the secondary containment poses no threat to human health or the environment because the waste continues to be contained in a sealed vessel In the event that the secondary containment should leak the containment pan installed beneath the tank provides tertiary containment

4 2 1 2 3 Secondary Containment and Leak Detection Requirements for Ancillary Equipment

Secondary containment for the SAL tank system ancillary equipment is provided by the containment pan below the SAL tank by double walled piping for the sample line between the tank and the sample station and by daily visual inspection during use of the entire system including the existing single walled piping Flanged and threaded connections joints and other connections are located within the confines of the containment pan Outside this pan only double walled piping and welded piping is allowed The pumps are magnetic coupling pumps located above the pan All material of construction is stainless steel for welded parts the material is 316L stainless steel Stainless steel material is compatible with the expected corrosive dangerous and mixed waste stored in the SAL tank The strength and thickness of the piping equipment supports and containment pan are designed to onsite standards that take into account seismic requirements for the region and corrosion protection The entire system is located on an existing basement floor built in the 1960s The 325 Building has proven over time to be of a sound structural integrity to withstand mild earthquake forces The containment pan has a liquid element sensor that alarms immediately at the main control panel should any leakage be detected The containment pan has a 203 centimeter diameter and a 51 centimeter height or 1 648 liters of capacity The containment pan will hold the total capacity of the 1 218 liter SAL tank plus any potential process water that also might be released In the event of an alarm the process water solenoid valves will become de energized to the closed position to minimize the loss of additional water

The 325 Building is staffed or monitored 24 hours a day 7 days a week The control system is designed to alarm on any leak/spill or high level alarm encountered The personnel responding to the alarm

condition will stop or secure the action causing the leak/spill warn others of the spill isolate the spill area and minimize individual contamination and exposure The spilled or leaked waste will be removed in an expeditious manner according to procedures for cleaning up spills and leaks

4 2 1 2 4 Controls and Practices to Prevent Spills and Overflows

The SAL tank system has been designed to account for safe and reliable operation to prevent the system from rupturing leaking corroding or otherwise failing The tank is provided with redundant level instrumentation to monitor tank levels Both capacitance and conductance level probes are used for level monitoring and alarming The tank will alarm on high level and interlock the process water to fail close The process water is supplied to both the hot cells and the tank system The containment pan is equipped with a liquid sensing element to detect the presence of liquid and alarms at the main control panel if liquid is detected Normally liquid is drained to the tank by operators pouring solution into the troughs in the hot cells This operation is carried out in a batch mode If this operation sets off a high level alarm the operators stop pouring solution into the troughs Even if this operation caused an alarm condition no spill is expected because the tank has sufficient freeboard to hold additional waste solution The initial level alarm is set at 92 percent of full volume

Trained personnel respond to spills by stopping or securing the action causing the spill notifying others in the area of the spill and following guidance provided in the 325 Building Emergency Plan and the 325 HWTUs Contingency Plan (Chapter 7 0) Measures are in place to inspect the system daily

4 2 1 3 Tank Management Practices [D 2d]

According to operating procedures liquid waste is poured into the troughs The troughs tie into the 5 08 centimeter drain header located under the hot cells This drain header is sloped down to the SAL tank located in Room 32 of the basement The existing drain header is the only method of introducing mixed waste solutions into this tank The drain line is fully welded and is constructed of 316L stainless steel material Because this drain line also serves as the SAL tank vent line the SAL tank operates at the same pressure as that of the hot cells The heating ventilation and air conditioning operating pressure for the hot cells and therefore the SAL tank is 1 27 centimeters water (vacuum) The SAL tank operates at slightly subatmospheric pressure and no pressure controls are necessary for this tank system

The SAL tank is fully monitored with tank level instruments A main control panel provides level status and high alarm annunciation Two control panels are provided with the SAL tank monitoring system One control panel is located adjacent to the sampling station in Room 32 to control the sampling pump when samples are pulled A second control panel is located on the operating floor in Room 201 the SAL main operating gallery Tank status is monitored from the first floor control panel Because waste solution is generated in a batch mode waste solution drained to the tank is effectively controlled through operating and administrative procedures in order to prevent high level alarm conditions A safety cutoff system for the tank will shut off all incoming water to the SAL in conjunction with a high level alarm condition A backup tank system was determined to be unnecessary for the SAL operations because of the presence of tank monitoring devices and the use of administrative and operational (batch processing) controls

The tank transfer controls provide similar safety features Once the SAL tank contains sufficient volume the tank s solution is prepared for transfer to the RLWS After waste characterization is completed the transfer to the RLWS is initiated by following internal TSD procedures Once started the transfer continues until a low level condition automatically stops the transfer pump or until it is stopped by operator action The solution can be transferred to the RLWS by either the transfer gear pump or by the water jet Currently the RLWS piping is a 316L stainless steel single walled pipeline inside the

basement from the SAL tank to the RLWT Piping from the SAL tank to the RLWS tank will be single walled 316L stainless steel while the piping from the RLWS tank to the truck lock will be double walled 316L stainless steel

4 2 1 4 Marking or Labeling [D 2e]

Due to the high radiation levels associated with the SAL tank the tank itself is not labeled The tank is located in a locked room to prevent unnecessary radiation exposure Access points to the room are labeled to meet the requirements of WAC 173 303 395 The marking of the access points is legible from a distance of 15 meters and identifies the waste The label adequately warns employees emergency response personnel and the public of the major risks associated with the waste being stored within the tank The tank also has a written placard identifying important radioactivity criticality and hazard concerns

4 2 1 5 Ignitable Reactive, and Incompatible Waste [D 2h]

Many different types of samples and waste materials will be brought to the SAL hot cells for analytical or research activities These samples are accompanied by an internal PNNL documentation form that provides waste characterization information from the sample generating unit Chemical characterization provided in these forms is based on previous chemical analysis or process knowledge The hazard potential includes exposure to radiation corrosive chemicals and hazardous chemicals All operations performed in the SAL hot cells are conducted by qualified operators following approved procedures Typical hot cell analytic processes generate liquid waste that is highly acidic and/or that have a high chloride level A small quantity of organic waste is generated and segregated prior to treatment or disposal If heavy metals are present in the liquid waste before neutralization the metals are precipitated as hydroxides incident to the neutralization and are filtered from the solution If the chloride content of the liquid is above 0 01 Molar the chlorides may be removed through silver nitrate precipitation Therefore waste solutions are not expected to be ignitable reactive or incompatible when transferred to the SAL tank

The following factors will ensure a safe and reliable tank system with regard to ignitable reactive and incompatible waste the tank system operates at ambient temperatures and pressures all waste added to the tank meets the RLWS waste acceptance criteria the tank construction material is stainless steel and the operators are trained in the applicable procedures and have past operating experience

4 2 2 Radioactive Liquid Waste Tank (RLWT) System

The Radioactive Liquid Waste Tank (RLWT) system consists of a 11 355 liter waste tank in the basement of the 325 Facility and piping from Room 52 and the SAL Hot Cell Facility The RLWT system is intended for the management and disposal of high dose and difficult to manage aqueous waste After collection in the RLWT the waste is transferred to a shielded transportation cask and shipped to the double shell tanks in the 200 Area The 325 Facility is expected to continue to generate approximately 5 678 to 7 570 liters of radioactive liquid waste each year The RLWT sits below the basement floor in a tank pit

4 2 2 1 Design Installation, and Assessment of Tank Systems [D 2a]

The following sections discuss the design of the RLWT system Information on the integrity assessment was provided in accordance with WAC 173 303 640 and 810

4 2 2 1 1 Design Requirements [D 2a(1)]

The RLWS tank is constructed of 316L stainless steel This material is compatible with any of the dangerous waste that is discharged to the tank Waste in the RLWT will be treated or reacted if needed to protect the tank integrity

The RLWT system design was reviewed by an independent qualified registered professional engineer to verify that the strength of the material is adequate and that it can withstand the stress of daily operation before operations began The professional engineer s evaluation is included in the tank integrity assessment

The RLWT is a vertical single shell tank supported by multiple legs and stand approximately 2 4 meters in height and 2 4 meters in diameter The tank has a welded construction of 316L stainless steel and sit approximately 15 2 centimeters above the floor in the tank pit with a formed bottom to minimized a heel in the tank The tank is located inside a concrete pit below the basement floor The tank pit is lined with a stainless steel liner on the floor and approximately 0 6 meters up the walls to allow for a secondary containment capacity of at least 100% of the tank Sealant was placed along the walls at the end of the liner and the remaining portion of the concrete pit walls were painted with a chemically resistant coating A concrete shielding cover was placed over the pit A tank control room constructed of steel studs and gypsum is located on the west side of the tank pit

The primary tank control panels are located in the control room and secondary control panels are located in the truck lock Room 601 Room 201 and in the operator s office Conductivity probes are installed in the tank at 305 mm intervals Signals from the probes indicate the liquid level in the tank by signal lights on all control panels Other signals from the conductivity probes alarm high liquid level by a signal light on each control panel plus sound on the panel in the operator s office

Liquid waste enters the RLWT through gravity flow piping A mixing pump provides agitation of the tank contents Mixing pump system controls are installed on the control panel in the control room

Samples will be collected prior to transferring the waste from the RLWS tank to the DST System A sampling pump and recirculating loop was installed on the tank A small sample hood is located in the control room Controls for the sample hood are located near the sample hood This hood is connected to the HEPA filtered exhaust system

4 2 2 1 2 Integrity Assessments [D 2a(2) and D 2a(3)]

An independent qualified registered professional engineer s tank integrity certification was completed and provided to Ecology before the tank system begins operation

4 2 2 2 Secondary Containment and Release Detection for Tank System [D 2b]

This section describes the secondary containment systems and leak detection systems installed in the RLWT system

4 2 2 2 1 Requirements for Tank Systems [D 2b(1) D 2b(2)(b) and D 2b(2)(c)]

The secondary containment system for the RLWT consists of the stainless steel liner in the bottom of the concrete tank pit and 0 6 meters up the tank pit walls The remaining portion of the concrete walls are painted with a chemically resistant coating and the boundary between the steel liner and the coating is sealed

The welded single walled transfer piping will be visually inspected for leaks within 24 hours of a transfer The 325 Building provides additional containment The basement floors are concrete and any liquid release remains in the immediate area until cleanup

The transfer piping from the SAL tank to the RLWT is single walled welded stainless steel pipe *Sections of the RLWT system piping has secondary containment where feasible Secondary containment* for the piping system consists of double walled stainless steel pipe with outlet valves at the ends Secondary containment piping was installed on the new line from Room 40A to the RLWT Secondary containment piping was also installed on the line between Room 528 and the RLWT and from the RLWT to the cask loading station Any leaks in the primary piping will cause liquid to gravity flow to the area of the pipe containing the outlet valve An increase in radiological dose will be seen if liquid is collecting in the annulus

4 2 2 2 2 Requirements for Secondary Containment and Leak Detection

The secondary containment was designed to prevent any migration of waste or accumulated liquid from the tank system to the soil groundwater or surface water The secondary containment system is able to detect and collect releases of accumulated liquids Remote television cameras provide a surveillance system for the RLWT ancillary equipment and general viewing of the tank pit Viewing screens and controls are located in the control room The following is the system description based on conceptual design

Materials of construction The RLWT and components are constructed of 316L stainless steel this material is compatible with the aqueous waste being discharged to the tank The waste has a pH between 7 and 12 and the chloride ion concentration averages less than 0 01 Molar

Strength of materials The system design was reviewed by an independent qualified registered professional engineer to verify that the strength of materials is adequate and that the tank can withstand the stress of daily operation before operations began

Strength of foundation The system design was reviewed by an independent qualified registered professional engineer to verify that the strength of the tank mounting and foundation is adequate to withstand the Design Basis Earthquake (DBE) before operations began This ensures that the foundation is capable of providing support to the tank and will resist settlement compression or uplift

Leak detection system description *Conductivity probes are installed inside the single walled tank to* detect the liquid level in the tank Any leaks from the tank will be collected in the stainless steel lined tank pit Liquid sensing tape is installed in the bottom of the tank pit to detect any leak of liquid from the primary containment If liquid is detected alarms will sound immediately in a local control panel and in the operator s room

Removal of liquids from secondary containment The RLWT secondary containment the lined tank pit is designed to contain a liquid leak from the tank until provisions can be made to remove the liquid The liquid might not be removed within 24 hours because of the coordination that must take place in the 325 Building and the DST personnel A dip tube installed in the tank pit extends from the bottom of the pit to the outside of the vault and is capped at the top If liquid were detected in the tank pit the liquid will be removed by connecting a transfer pump to the dip tube Any liquid removed from the secondary containment would be transferred to the DSTs in a manner consistent with the transfer of waste from the RLWT to the DSTs

A delay of greater than 24 hours in removing the liquid from the secondary containment poses no threat to human health or the environment because the waste continues to be contained in the tank pit

4 2 2 2 3 Secondary Containment and Leak Detection Requirements for Ancillary Equipment

Secondary containment for the RLWT system ancillary equipment will be provided by the lined tank pit double walled piping and daily visual inspection during use of the entire system including the existing single walled piping All material of construction will be stainless steel for welded parts the material is 316L stainless steel Stainless steel material is compatible with the expected corrosive dangerous and mixed waste stored in the tank The strength and thickness of the piping equipment supports and secondary containment are designed to onsite standards that take into account seismic requirements for the region and corrosion protection The entire system is located on an existing basement floor built in the 1960s The 325 Building has proven over time to be of a sound structural integrity to withstand mild earthquake forces The tank pit has a liquid element sensor that alarms immediately at the main control panel should any leakage be detected The tank pit will hold the total capacity of the 11 355 liter tank plus any potential process water that also might be released In the event of an alarm the process water solenoid valves will become de energized to the closed position to minimize the loss of additional water

The 325 Building is staffed or monitored 24 hours a day 7 days a week The control system is designed to alarm on any leak/spill or high level alarm encountered The personnel responding to the alarm condition will stop or secure the action causing the leak/spill warn others of the spill isolate the spill area and minimize individual contamination and exposure The spilled or leaked waste will be removed in an expeditious manner according to procedures for cleaning up spills and leaks

4 2 2 2 4 Controls and Practices to Prevent Spills and Overflows

The RLWT system has been designed to account for safe and reliable operation to prevent the system from rupturing leaking corroding or otherwise failing The tank is provided with redundant level instru mentation to monitor tank levels Conductance level probes are used for level monitoring and alarming as well as a secondary tank level monitoring system The tank will alarm on high level and interlock the process water to fail close

Trained personnel respond to spills by stopping or securing the action causing the spill notifying others in the area of the spill and following guidance provided in the 325 Building Emergency Plan and the 325 HWTUs Contingency Plan (Chapter 7 0) Measures are in place to inspect the system daily

4 2 2 3 Tank Management Practices [D 2d]

The RLWT was installed in an existing pit in the basement entirely below grade The top of the tank is shielded by a concrete deck on top of the pit The deck is constructed of multiple stepped cover blocks to simplify installation/removal

The single wall vertical tank is supported by multiple legs Secondary containment is provided by lining the lower portion of the tank pit The stainless steel liner is sealed to the pit wall and the wall above the liner will be coated with a chemical resistant material The tank is operated near atmospheric pressure and vented through HEPA filters

The primary panel in the control room is adjacent to the tank pit Other Liquid level monitoring panels are located in Room 601 325A truck lock Room 201 Room 527 and the power operator s office The tank is monitored with two liquid level instruments and meters/indicating lights are provided in all control panels Several of the panels have high liquid level alarms These alarms are audible or visual depending on location

There is a leak detection system for the double walled piping and the tank pit liner Liquid sensing cable is connected to alarms in the operator s office There are remotely operated TV cameras in the pit to

inspect the tank and the liner These cameras will be viewed by operators when performing the daily inspection of the tank for evidence of corrosion and releases of dangerous waste

Because liquid waste is generated in a batch mode waste drained to the RLWT will be effectively controlled through operating and administrative procedures in order to prevent high level alarm conditions When there is an alarm a safety cutoff system will shut off all incoming process water lines

A backup tank system was determined to be unnecessary because of the presence of tank monitoring devices and the use of administrative and operational (batch processing) controls

Liquid waste will be transported from 325 Building to DSTs using the cask system The 325A truck lock has been modified to handle the cask system There is a transfer line with secondary containment in 325 Building between the tank and the truck lock A pump is used to transfer the waste from the RLWT to the truck lock

Prior to transferring waste from the RLWT responsible personnel will schedule the cask system for a waste transfer A small quantity of waste will be obtained for characterization using a sample pump and small hood The cask system will be positioned in the 325A truck lock Transfer of the waste to the cask system will be performed in accordance with 325 Building and approved cask system procedures

4 2 2 4 Marking or Labeling [D 2e]

Due to the high radiation levels associated with the RLWT the tank itself is not labeled The tank is located below grade in a sealed pit Access points to the tank pit are labeled to meet the requirements of WAC 173 303 395 The marking of the access points is legible from a distance of 15 meters and identifies the waste The label will adequately warn employees emergency response personnel and the public of the major risks associated with the waste being stored within the tank The RLWT also has a written placard identifying important radioactivity criticality and hazard concerns

4 2 2 5 Ignitable Reactive and Incompatible Waste [D 2h]

Many different types of samples and waste materials will be brought to the SAL hot cells and the HWTU These samples are accompanied by an internal PNNL documentation form that provides waste characterization information from the sample generating unit Chemical characterization provided in these forms is based on previous chemical analysis or process knowledge The hazard potential includes exposure to radiation corrosive/flammable chemicals and hazardous chemicals

Prior to transferring wastes to the RLWT system the wastes are evaluated to ensure compatibility with the system and to preclude introduction of flammable or reactive waste in order to protect the integrity of the new RLWS tank The RLWT system is equipped with treatment capabilities including neutralization and chloride removal These treatment systems include chemical additive tanks and a tank agitator

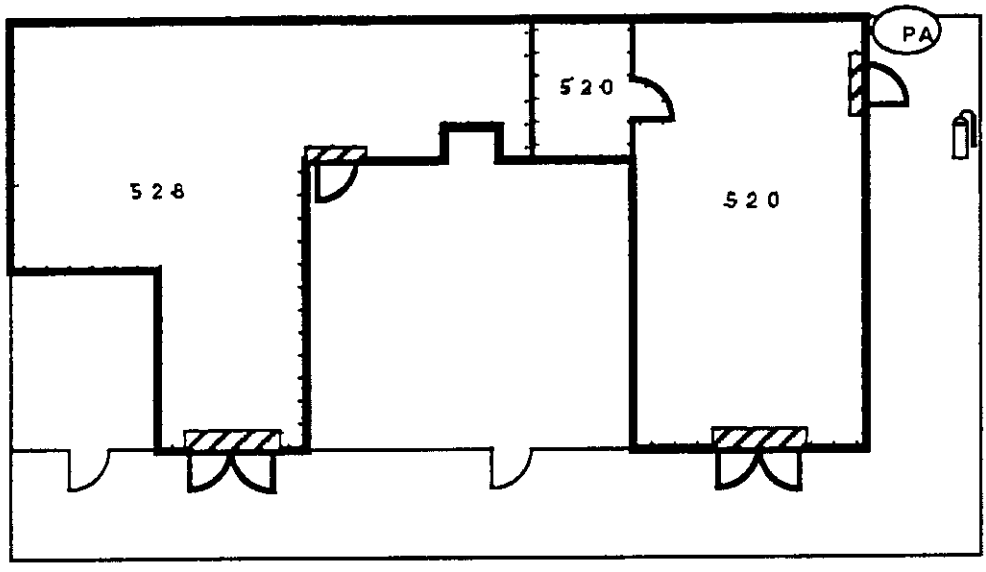
Based on analytical results and process knowledge of the 325 laboratories generating the waste treatment of the SAL generated waste prior to discharge and agitation and treatment capabilities in the RLWT waste solutions are not expected to be ignitable reactive or incompatible

The following factors will ensure a safe and reliable tank system with regard to ignitable reactive and incompatible waste the tank system operates at ambient temperatures and pressures all waste added to the tank meets the RLWS waste acceptance criteria the tank construction material is stainless steel and the operators are trained in the applicable procedures and have past operating experience Closure of the RLWT is addressed in Section 11 4

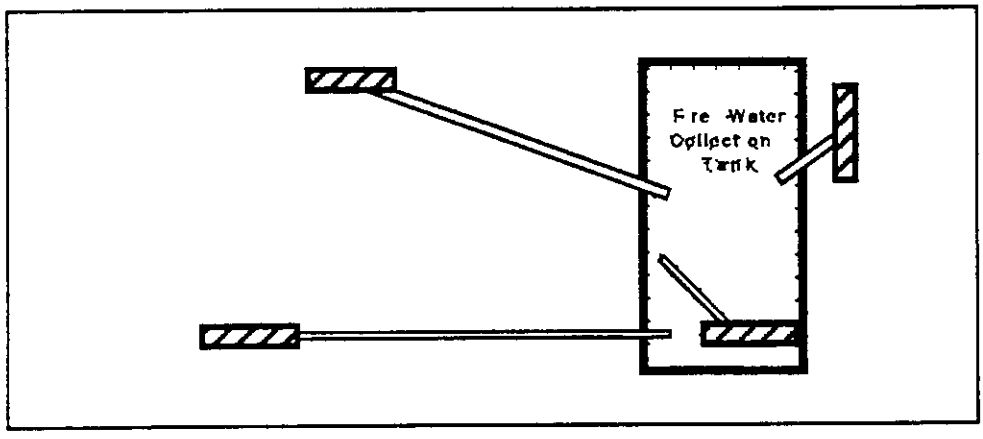
4 3 AIR EMISSIONS CONTROL [D 8]

The air emissions standards on 40 CFR 265 Subpart AA and BB do not apply to any part of the 325 HWTUs Containers in the 325 HWTUs are primarily managed as mixed waste Such containers are exempt from 40 CFR 264 Subpart CC by 40 CFR 264 1080(6)

1 **Figure 4 1 Hazardous Waste Treatment Unit Secondary Containment System**



First Floor



Basement

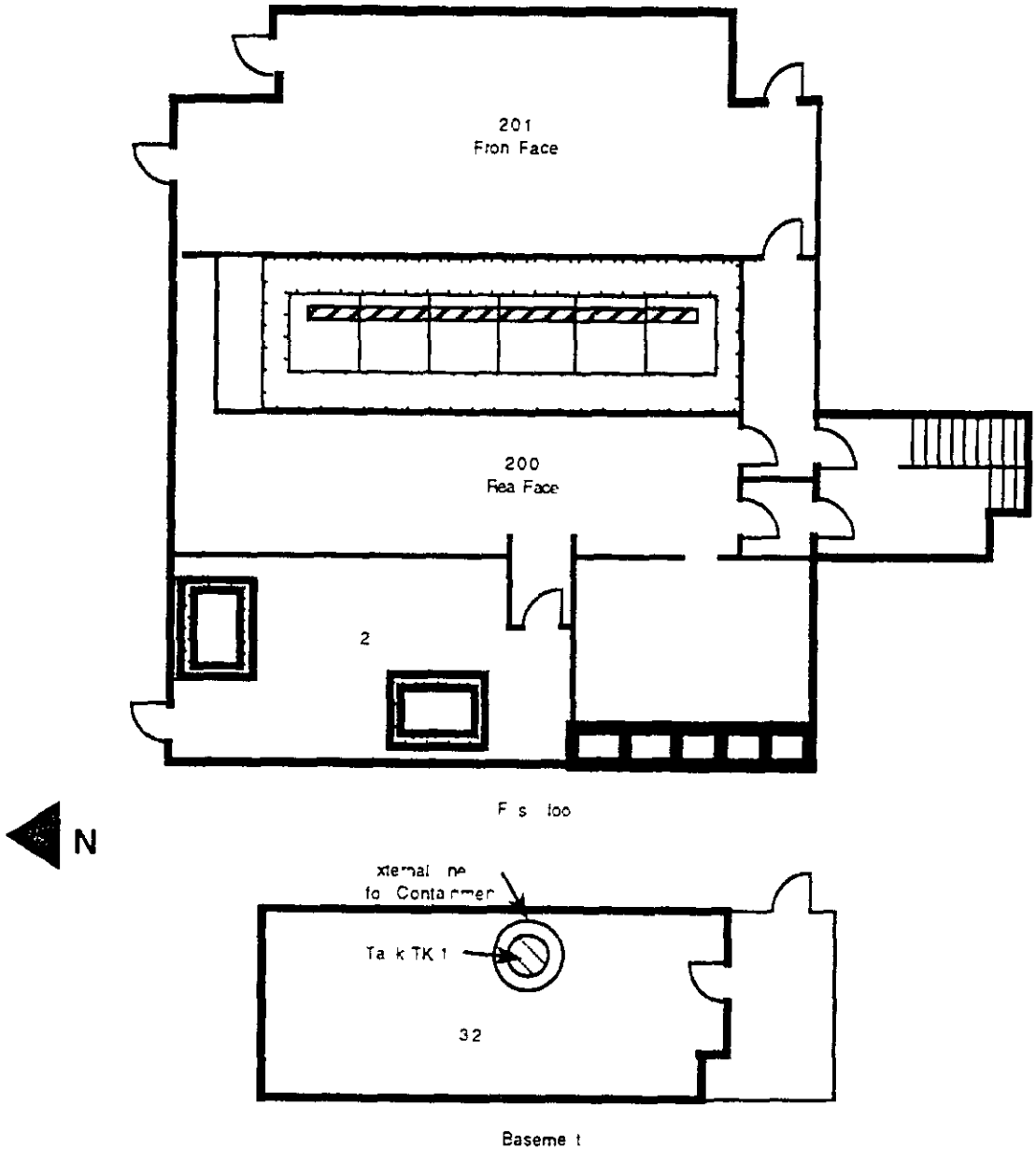
Collection Trough

Hazardous Waste Treatment Unit (shaded area)

2

1

Figure 4 2 Hot Cell Secondary Containment System



2

Table 4 1 Typical Storage Containers Used at the 325 Hazardous Waste Treatment Units

1	Material of construction	Waste Capacity
2	Glass container/bottles	1 milliliter to 3 79 liters
3	Plastic containers/bottles	1 milliliter to 19 liters
4	Paint cans	0 47 liters to 4 73 liters
5	Steel containers	114 liters 322 liters
6	Plastic lined steel containers	114 liters 208 liters
7	Steel shielded 208 liter container	Various nominal capacity depending on necessary shielding 3 79 liters 53 liters
8	Overpack containers	322 liters

Hanford Facility RCRA Permit Modification Notification Forms

Part V Chapter 20 and Attachment 46

300 Area Waste Acid Treatment System

Index

Hanford Facility RCRA Permit Modification Notification Form

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Description of Modification

Hanford Facility RCRA Permit Table of Contents

Permit Number WA7890008967
Revision Number 7
Expiration Date September 27 2004
Page 5 of 129

Modification Class [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes	X			

Relevant WAC 173 303 830 Appendix I Modification A 1

Enter wording of the modification from WAC 173 303 830, Appendix I citation
A General Permit Provisions
1 Administrative and Informational changes

Submitted by Co Operator	Reviewed by RL Program Office	Reviewed by Ecology	Reviewed by Ecology
N C Boyter 3 21 02 Date	for D T Evans 4/1/02 Date	R Bond Date	L E Ruud Date

[1] Class 1 modifications requiring prior Agency approval

[2] This is only an advanced notification of an intended Class [1]1 2 or 3 modification this should be followed with a formal modification request and consequently implement the required Public Involvement processes when required

[3] If the proposed modification does not match any modification listed in WAC 173 303 830 Appendix I then the proposed modification should automatically be given a Class 3 status This status may be maintained by the Department of Ecology or down graded to [1]1 if appropriate

Hanford Facility RCRA Permit Modification Notification Form	
Unit **300 Area Waste Acid Treatment System**	**Permit Part & Chapter** **Part V Chapter 20**

Description of Modification

Hanford Facility RCRA Permit Part V Chapter 20

Permit Number WA7890008967
Revision Number 7
Expiration Date September 27 2004
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CHAPTER 20
300 Area Waste Acid Treatment System
(Partial Closure Plan Completed, December 3, 2001)

Modification Class [1 2 3] Please check one of the Classes	Class 1 X	Class [1]1	Class 2	Class 3

Relevant WAC 173 303 830 Appendix I Modification A 1

Enter wording of the modification from WAC 173 303 830, Appendix I citation
A General Permit Provisions
1 Administrative and Informational changes

Submitted by Co Operator		Reviewed by RL Program Office		Reviewed by Ecology		Reviewed by Ecology	
N C Boyter	Date 3/21/02	for D T Evans	Date 4-1-02	R Bond	Date	L E Ruud	Date

[1] Class 1 modifications requiring prior Agency approval

[2] This is only an advanced notification of an intended Class [1]1 2 or 3 modification this should be followed with a formal modification request and consequently implement the required Public Involvement processes when required

[3] If the proposed modification does not match any modification listed in WAC 173 303 830 Appendix I then the proposed modification should automatically be given a Class 3 status This status may be maintained by the Department of Ecology or down graded to [1]1 if appropriate

Hanford Facility RCRA Permit Modification Notification Form

Unit	Permit Part & Chapter
300 Area Waste Acid Treatment System	List of Attachments

Description of Modification

Hanford Facility RCRA Permit List of Attachments

Attachment 46 300 Area Waste Acid Treatment System Part A Form 3 Revision 5 dated October 1 1996 and Closure Plan DOE/RL 90 11 Revision 2 dated May 1999 (Partial Closure Plan Completed December 3 2001)

Modification Class [1,2,3] Please check one of the Classes	Class 1	Class [1]1	Class 2	Class 3
	X			

Relevant WAC 173 303 830 Appendix I Modification A 1

Enter wording of the modification from WAC 173 303 830, Appendix I citation

A General Permit Provisions

1 Administrative and Informational changes

Submitted by Co Operator	Reviewed by RL Program Office	Reviewed by Ecology	Reviewed by Ecology
N C Boyter 3210 Date	for D T Evans Date	R Bond Date	L E Ruud Date

[1] Class 1 modifications requiring prior Agency approval

[2] This is only an advanced notification of an intended Class [1]1 2 or 3 modification this should be followed with a formal modification request and consequently implement the required Public Involvement processes when required

[3] If the proposed modification does not match any modification listed in WAC 173 303 830 Appendix I then the proposed modification should automatically be given a Class 3 status This status may be maintained by the Department of Ecology or down graded to [1]1 if appropriate

Hanford Facility RCRA Permit Modification Notification Form

Unit	Permit Part & Chapter
300 Area Waste Acid Treatment System	300 Area WATS Part A Form 3

Description of Modification

300 Area WATS Part A Form 3 Comment Block Page 1

Partial Closure Plan Completed 12/03/01

Modification Class [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes	X			

Relevant WAC 173 303 830 Appendix I Modification A 1

Enter wording of the modification from WAC 173 303 830, Appendix I citation

A General Permit Provisions

1 Administrative and Informational changes

Submitted by Co Operator	Reviewed by RL Program Office	Reviewed by Ecology	Reviewed by Ecology
N C Boyter 3 21 02	David W Templeton 4/1/02		
N C Boyter Date	for D T Evans Date	R Bond Date	L E Ruud Date

[1] Class 1 modifications requiring prior Agency approval

[2] This is only an advanced notification of an intended Class [1]1 2 or 3 modification this should be followed with a formal modification request and consequently implement the required Public Involvement processes when required

[3] If the proposed modification does not match any modification listed in WAC 173 303 830 Appendix I then the proposed modification should automatically be given a Class 3 status This status may be maintained by the Department of Ecology or down graded to [1]1 if appropriate

Hanford Facility RCRA Permit Modification Notification Form

Unit	Permit Part & Chapter
300 Area Waste Acid Treatment System	300 Area WATS Part A Form 3

Description of Modification

300 Area WATS Part A Form 3 Section III C

The 300 Area Waste Acid Treatment System (300 Area WATS) permanently ceased operations in 1995. Information provided on this form pertaining to unit processes, design capacities, or dangerous waste managed at the unit is for historical purposes only.

The 300 Area WATS was a tank system that operated from 1973 until 1995 treating and storing mixed and dangerous waste. Partial closure activities for this unit began in 1996 and were completed September 1999. Closure activities occurred in three phases and in accordance with the approved closure plan and the requirements of Part V Chapter 20 of the Hanford Facility RCRA Permit (Permit Number WA7890008967). Clean closure was achieved for all 300 Area WATS locations and components with the exception of two locations of potential soil contamination. The areas of potential soil contamination are defined by Part V Chapter 20 of the Hanford Facility Resource Conservation and Recovery Act of 1976 (RCRA) Permit (Permit Number WA7890008967) and are shown as Area 1 and 2 in the Figure. Area 1 is located beneath the concrete WATS and U Bearing Piping trench that itself is not a portion of the TSD unit. Area 2 is located beneath the scabbled concrete floor of the 313 Building.[1]

In December 2001 Ecology (Letter G. P. Davis, Ecology to J. B. Hebdon, U.S. Department of Energy) accepted certification for the clean closed 300 Area WATS locations and released these clean closed locations from the requirements of RCRA and Chapter 173-303 of the Washington Administrative Code (WAC). The soil at Areas 1 and 2 will remain unclosed and regulated by RCRA Chapter 173-303 WAC until soil disposition in conjunction with the future 300-FF-2 Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) Operable Unit remedial action. Concrete surfaces over unclosed soil will remain until the time of soil disposition. Closure of these areas will complete 300 Area WATS closure.

T01, S02, T04

The 300 Area Waste Acid Treatment System (300 WATS) and Tank 40 began waste management operations in April 1973 and ancillary equipment and centrifuge operations began November 1995. The 300 WATS was used for the treatment and storage of mixed waste generated during fuel fabrication operations in the 300 Area. The 300 WATS also was used for disposing of used and/or unneeded chemicals for other Hanford Facility operations. A portion of the waste initially was treated in two tanks (tanks 7 and 11) in the 333 Building to reduce the chromium (VI) to chromium (III). From May 1983 to January 1987 tanks 7 and 11 were used twice a year to treat up to 757 liters (200 gallons) per day of waste (T01). This waste along with all other waste acid generated in the 333 Building was drained to the 334-A Building and stored in two storage tanks (tanks B and C) (S02) with a combined volume of 15 142 liters (4 000 gallons). Previously waste entered the 334 A Building passing through a settling tank [tank A volume 1,363 liters (360 gallons)] before entering tanks B and C. Tank A ceased receiving waste in August 1984 when piping was disconnected to the tank and waste was routed directly to tanks B and C. Tank A was cleaned out and the polyvinyl chloride liner removed in 1988.

From startup in April 1973 until August 1973 the waste acid from the 333 Building was collected in a plastic lined steel underground 14 385 liter (3 800 gallon) tank and a plastic lined steel above ground 22 712 liter (6 000 gallon) tank (tank 4) in the 334 Tank Farm. At that time the underground tank developed a leak and was removed from service. The 334 A Building storage tanks replaced the six underground tank in December 1974. Tank 4 was retained for emergency storage when the 313 Building neutralization activities were down for maintenance or modifications. Tank 4 usually was empty and when the tank was filled in January 1986 a leak developed near the top of the tank. Tank 4 was emptied and abandoned at that time. Tank 4 was removed cleaned and disposed of in September 1988.

The waste acid was pumped from the 334 A Building to the 313 Building where the waste acid underwent pH adjustment. A waste acid neutralization tank (tank 2) (T01) Tank 2 was capable of treating a maximum of 13 249 liters (3 500 gallons) per day of waste acid. The waste acid was pumped from tank 2 to tank 11 and then to a centrifuge where the waste acid underwent further treatment to separate the liquid and solid phases (T04). A maximum of 11 356 liters (3 000 gallons) of waste could be treated. The centrifuge. The solid waste from the centrifuge was collected in containers and transferred to the 30 K Storage Unit. The liquid effluent was pumped from the centrifuge to tank 5 and to a filter press for additional treatment to remove fine solids (T04) while remained following treatment to the centrifuge. The filtered liquid effluent was pumped from the 311 Tank Farm.

T01, S02. The 311 Tank Farm was used for storage of treated liquid effluents from both the 300 WATS and the uranium recovery process. Storage occurred in two tanks (tanks 40 and 50) with capacities of 15 142 and 18 927 liters (4 000 and 5 000 gallons) respectively. Tanks 40 and 50 are constructed of stainless steel. Tank 50 the 18 927 liter (5 000 gallon) tank occasionally was used for decant storage when the centrifuge in the 313 Building was down for maintenance. Tank 50 was capable of treating up to 18 927 liters (5 000 gallons) per day but only was used occasionally for decanting waste (total of five times between January 1986 and December 1987). Auxiliary equipment (two pumps two cartridge filters and two sample ports) are housed in the adjacent 303 F Building. Auxiliary equipment was used to filter solutions and to recirculate the solution between tanks and the 313 Building for process.

Modification Class [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes	X			

Relevant WAC 173-303-830 Appendix I Modification: A.1

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions

1. Administrative and Informational changes

Submitted by Co-Operator	Reviewed by RL Program Office	Reviewed by Ecology	Reviewed by Ecology
N. C. Boyter 3/21/02	for D. T. Evans 4/2/02	R. Bond Date	L. E. Ruud Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2 or 3 modification this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology or down graded to [1]1 if appropriate.

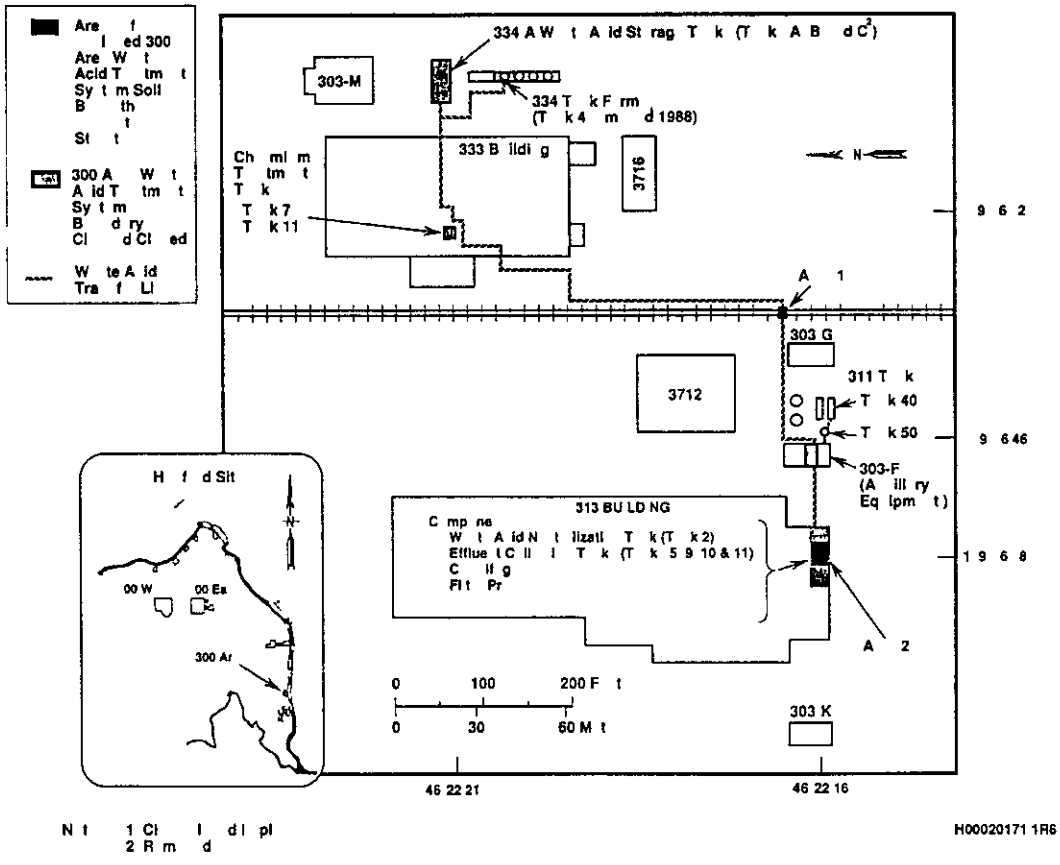
Hanford Facility RCRA Permit Modification Notification Form

Unit	Permit Part & Chapter
300 Area Waste Acid Treatment System	300 Area WATS Part A Form 3

Description of Modification

300 Area WATS Part A Form 3 Figure Replace figure

300 Area Waste Acid Treatment System



Modification Class [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes	X			

Relevant WAC 173 303 830 Appendix I Modification A 1

Enter wording of the modification from WAC 173 303 830, Appendix I citation

A General Permit Provisions

1 Administrative and Informational changes

Submitted by Co Operator		Reviewed by RL Program Office		Reviewed by Ecology		Reviewed by Ecology	
N C Boyter	Date 3/21/02	for D T Evans	Date 4/1/02	R Bond	Date	L E Ruud	Date

[1] Class 1 modifications requiring prior Agency approval

[2] This is only an advanced notification of an intended Class [1]1 2 or 3 modification this should be followed with a formal modification request and consequently implement the required Public Involvement processes when required

[3] If the proposed modification does not match any modification listed in WAC 173 303 830 Appendix I then the proposed modification should automatically be given a Class 3 status This status may be maintained by the Department of Ecology or down graded to [1]1 if appropriate

Hanford Facility RCRA Permit Modification Notification Form	
Unit: 300 Area Waste Acid Treatment System	**Permit Part & Chapter:** 300 Area WATS Part A, Form 3

Description of Modification:

300 Area WATS Part A, Form 3, Photographs: Delete all photographs replace with the following:

300 Area Waste Acid Treatment System
Substructure Soil Contamination Location - Area 1

00070107-6cn
(PHOTO TAKEN 2000)

Modification Class: [1] [2] [3] Please check one of the Classes:	Class 1	Class [1]1	Class 2	Class 3
	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions
1. Administrative and Informational changes.

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
N C Boyter 3.21.02		David W Templeton 4/1/02					
N. C. Boyter	Date	for D. T. Evans	Date	R. Bond	Date	L.E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

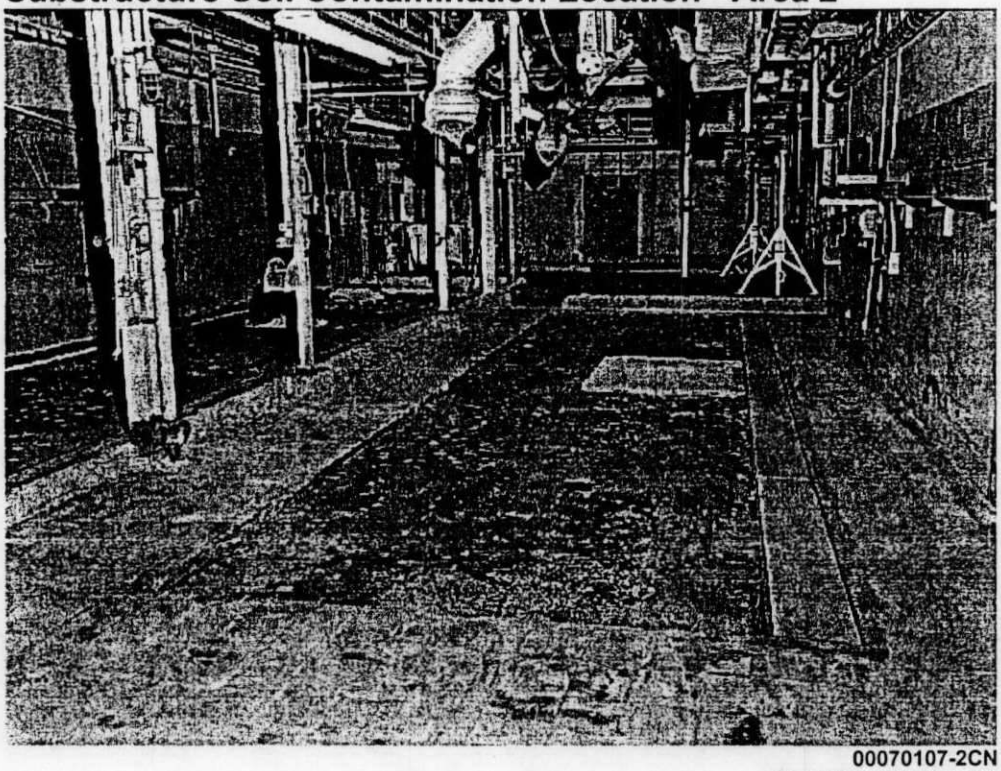
Hanford Facility RCRA Permit Modification Notification Form	
Unit: 300 Area Waste Acid Treatment System	**Permit Part & Chapter:** 300 Area WATS Part A, Form 3

Description of Modification:

300 Area WATS Part A, Form 3, Photographs: Add the following photograph.

300 Area Waste Acid Treatment System

Substructure Soil Contamination Location - Area 2



00070107-2CN
(PHOTO TAKEN 2000)

Modification Class: [1,2,3]	Class 1	Class [1]1	Class 2	Class 3
Please check one of the Classes:	X			

Relevant WAC 173-303-830, Appendix I Modification: A.1.

Enter wording of the modification from WAC 173-303-830, Appendix I citation

A. General Permit Provisions
   1. Administrative and Informational changes.

Submitted by Co-Operator:		Reviewed by RL Program Office:		Reviewed by Ecology:		Reviewed by Ecology:	
N. C. Boyter	Date 3-24-02	for D. T. Evans	Date 4/1/02	R. Bond	Date	L.E. Ruud	Date

[1] Class 1 modifications requiring prior Agency approval.

[2] This is only an advanced notification of an intended Class [1]1, 2, or 3 modification, this should be followed with a formal modification request, and consequently implement the required Public Involvement processes when required.

[3] If the proposed modification does not match any modification listed in WAC 173-303-830 Appendix I, then the proposed modification should automatically be given a Class 3 status. This status may be maintained by the Department of Ecology, or down graded to [1]1, if appropriate.

Hanford Facility RCRA Permit Modification Notification Form

Unit.	Permit Part & Chapter
300 Area Waste Acid Treatment System	311 Tanks Part A Form 3

Description of Modification

311 Tanks Part A Form 3 Comment Block Page 1

Closed – Capacity transferred to the 300 Area Waste Acid Treatment System 6/29/90

Modification Class [1,2,3] Please check one of the Classes	Class 1	Class [1]1	Class 2	Class 3
	X			

Relevant WAC 173 303 830 Appendix I Modification A 1

Enter wording of the modification from WAC 173 303 830, Appendix I citation

A General Permit Provisions

1 Administrative and Informational changes

Submitted by Co Operator	Reviewed by RL Program Office	Reviewed by Ecology	Reviewed by Ecology
N C Boyter 3-21-02	for D T Evans 4/1/02	R Bond	L E Ruud
N C Boyter Date	for D T Evans Date	R Bond Date	L E Ruud Date

[1] Class 1 modifications requiring prior Agency approval

[2] This is only an advanced notification of an intended Class [1]1 2 or 3 modification this should be followed with a formal modification request and consequently implement the required Public Involvement processes when required

[3] If the proposed modification does not match any modification listed in WAC 173 303 830 Appendix I then the proposed modification should automatically be given a Class 3 status This status may be maintained by the Department of Ecology or down graded to [1]1 if appropriate

Hanford Facility RCRA Permit Modification Notification Forms

Part V Chapter 20 and Attachment 46

300 Area Waste Acid Treatment System

Replacement Sections

Index

FORM 3	DANGEROUS WASTE PERMIT APPLICATION	I EPA/State I D No
		W A 7 8 9 0 0 0 8 9 6 7

OR OFFICIAL USE ONLY

Application Approved	Date Received (month/ day / year)	Comments
		Partial Closure Plan Completed 12/03/01

II FIRST OR REVISED APPLICATION

Place an X in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application If this is your first application and you already know your facility s EPA/STATE I D Number or If this is a revised application enter your facility s EPA/STATE I D Number in Section I above

A First Application (place an X below and provide the appropriate date)

☐ 1 **Existing Facility** (See instructions for definition of existing facility Complete item below)

MO	DAY	YEAR
03	22	1943

For existing facilities provide the date (mo/day/yr) operation began or the date construction commenced (use the boxes to the left)
The date construction of the Hanford Facility commenced

☐ 2 **New Facility** (Complete item below)

MO	DAY	YEAR

For new fac lities prov de the date (mo/day/yr) operation began or is expected to begin

B Revised Application (Place an X below and complete Section I above)

☒ 1 **Facility has an interim Status Permit**

☒ 2 **Facility has a Final Permit**

III PROCESSES – CODES AND DESIGN CAPACITIES

A Process Code – Enter the code from the list of process codes below that best describes each process to be used at the facility Ten lines are provided for entering codes If more lines are needed enter the codes(s) in the space provided If a process will be used that is not included in the list of codes below then describe the process (including its design capacity) in the space provided on the (Section III C)

B Process Design Capacity – For each code entered in column A enter the capacity of the process

1 Amount – Enter the amount

2 Unit of Measure – For each amount entered in column B(1) enter the code from the list of unit measure codes below that describes the unit of measure used Only the units of measure that are listed below should be used

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
STORAGE		
Container (barrel drum etc)	S01	Gallons or liters
Ta k	S02	Gallons or liters
Waste p le	S03	Cub c yards or c bic meters
S face impoundment	S04	Gallons o liters
	S06	Cubic yards or cub c meters
DISPOSAL		
Injection well	D80	Gallons or liters
Landf ll	D81	Acre feet (the volume that would cover one acre to a Depth of one foot) or hectare meter
Land application	D82	Acres or hectares
Ocean d sposal	D83	Gallons per day or liters per day
Surface impoundment	D84	Gallons or liters
TREATMENT		
Tank	T01	Gallons per day o liters pe day
S face impoundment	T02	Gallons per day or liters per day
Incinerator	T03	Tons pe ho or metric tons per hour gallons per hour or liters per hour
Other (use for physical chemical thermal or biological treatment processes not occurring in tanks surface impoundments or incinerators Describe the processes in the space provided Section III C)	T04	Gallons per day or liters per day

Unit of Measure	Unit of Measure Code	Unit of Measure	Unit of Measure Code	Unit of Measure	Unit of Measure Code
Gallons	G	Liters Per Day	V	Acre Feet	A
Liters	L	Tons Per Hour	D	Hectare Meter	F
ubic Yards	Y	Metric Tons Per Hour	W	Acres	B
ubic Meters	C	Gallons Per Hour	E	Hectares	Q
Gallons Per Day	U	Liters Per Hour	H		

III PROCESS – CODES AND DESIGN CAPACITIES (continued)

Example for Completing Section III (shown in line numbers X 1 and X 2 below) A facility has two storage tanks one tank can hold 200 gallons and the other can hold 400 gallons The facility also has an incinerator that can burn up to 20 gallons per hour

Line No	A Process Code (from list above)			B process Design Capacity 1 Amount (Specify)	B process Design Capacity 2 Unit of Measure (enter code)		For Official Use Only			
X 1	S	0	2	600	G					
X 2	T	0	3	20	E					
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

C Space for additional process codes or for describing other process (code T04) For each process entered here include design capacity

The 300 Area Waste Acid Treatment System (300 Area WATS) permanently ceased operations in 1995 Information provided on this form pertaining to unit processes design capacities or dangerous waste managed at the unit is for historical purposes only

The 300 Area WATS was a tank system that operated from 1973 until 1995 treating and storing mixed and dangerous waste Partial closure activities for this unit began in 1996 and were completed September 1999 Closure activities occurred in three phases and in accordance with the approved closure plan and the requirements of Part V Chapter 20 of the Hanford Facility RCRA Permit (Permit Number WA7890008967) Clean closure was achieved for all 300 Area WATS locations and components with the exception of two locations of potential soil contamination The areas of potential soil contamination are defined by Part V Chapter 20 of the Hanford Facility Resource Conservation and Recovery Act of 1976 (RCRA) Permit (Permit Number WA7890008967) and are shown as Area 1 and 2 in the Figure Area 1 is located beneath the concrete WATS and U Bearing Piping trench that itself is not a portion of the TSD unit Area 2 is located beneath the scabbled concrete floor of the 313 Building

In December 2001 Ecology (Letter G P Davis Ecology to J B Hebdon U S Department of Energy) accepted certification for the clean closed 300 Area WATS locations and released these clean closed locations from the requirements of RCRA and Chapter 173 303 of the Washington Administrative Code (WAC) The soil at Areas 1 and 2 will remain unclosed and regulated by RCRA Chapter 173-303 WAC until soil disposition in conjunction with the future 300 FF 2 Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) Operable Unit remedial action Concrete surfaces over unclosed soil will remain until the time of soil disposition Closure of these areas will complete 300 Area WATS closure

T01, S02, T04

The 300 Area Waste Acid Treatment System (300 WATS) and Tank 40 began waste management operations in April 1973 auxiliary equipment and centrifuge operations began in November 1995 The 300 WATS was used for the treatment and storage of mixed waste generated during fuel fabrication operations in the 300 Area The 300 WATS also was used for disposing of used and/or unneeded chemicals for other Hanford Facility operations A portion of the waste initially was treated in two tanks (tanks 7 and 11) in the 333 Building to reduce the chromium (VI) to chromium (III) From May 1983 to January 1987 tanks 7 and 11 were used twice a year to treat up to 757 liters (200 gallons) per day of waste (T01) This waste along with all other waste acid generated in the 333 Building was drained to the 334 A Building and stored in two storage tanks (tanks B and C) (S02) with a combined volume of 15 142 liters (4 000 gallons) Previously waste entered the 334 A Building passing through a settling tank [tank A volume 1 363 liters (360 gallons)] before entering tanks B and C Tank A ceased receiving waste in August 1984 when piping was disconnected to the tank and waste was routed directly to tanks B and C Tank A was cleaned out and the polyvinyl chloride liner removed in 1988

From startup in April 1973 until August 1973 the waste acid from the 333 Building was collected in a plastic lined steel underground 14 385 liter (3 800 gallon) tank and a plastic-lined steel aboveground 22 712 liter (6 000 gallon) tank (tank 4) in the 334 Tank Farm At that time the underground tank developed a leak and was removed from service The 334 A Building storage tanks replaced this underground tank in December 1974 Tank 4 was retained for emergency storage when the 313 Building neutralization activities were down for maintenance or modifications Tank 4 usually was empty and when the tank was filled in January 1986 a leak developed near the top of the tank Tank 4 was emptied and abandoned at that time Tank 4 was removed cleaned and disposed of onsite in 1988

The waste acid was pumped from the 334 A Building to the 313 Building where the waste acid underwent pH adjustment in a waste acid neutralization tank (tank 2) (T01) Tank 2 was capable of treating a maximum of 13 249 liters (3 500 gallons) per day of waste acid The waste acid was pumped from tank 2 to tank 11 and then to a centrifuge where the waste acid underwent further treatment to separate the liquid and solid phases (T04) A maximum of 11 356 liters (3 000 gallons) of waste acid per day could be treated in the centrifuge The solid waste from the centrifuge was collected in containers and transferred to the 303-K Storage Unit The liquid effluent was pumped from the centrifuge to tank 5 and to a filter press for additional treatment to remove fine solids (T04) which remained following treatment in the centrifuge The filter press treated a maximum of 4 542 liters (1 200 gallons) per day Solids collected in the filter press were sent to the uranium recovery system or to the 303 K Storage Unit The filtered liquid effluent was drained into effluent collection tanks (tanks 9 and 10) where the liquid effluent was stored temporarily before being pumped to the 311 Tank Farm

T01 S02 The 311 Tank Farm was used for storage of treated liquid effluents from both the 300 WATS and the uranium recovery process Storage occurred in two tanks (tanks 40 and 50) with capacities of 15 142 and 18 927 liters (4 000 and 5 000 gallons) respectively Tanks 40 and 50 are constructed of stainless steel Tank 50 the 18 927 l ter (5 000 gallon) tank occasionally was used for decanting waste when the centrifuge in the 313 Building was down for maintenance Tank 50 was capable of treating up to 18 927 liters (5 000 gallons) per day but only was used occasionally for decanting waste (a total of five times between January 1986 and December 1987)
Auxiliary equipment (two pumps two cartridge filters and two sample ports) are housed in the adjacent 303 F Building Auxiliary equipment was used to filter solutions and to recirculate the solutions between various tanks and the 313 Building for reprocessing

IV DESCRIPTION OF DANGEROUS WASTES

Dangerous Waste Number – Enter the digit number from Chapter 173 303 WAC for each listed dangerous waste you will handle If you handle dangerous wastes which are not listed in Chapter 173 303 WAC enter the four-digit number(s) that describes the characteristics and/or the toxic contaminants of those dangerous wastes

B **Estimated Annual Quantity** For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non listed waste(s) that will be handled which possess that characteristic or contaminant

C **Unit of Measure** For each quantity entered in column B enter the unit of measure code Units of measure which must be used and the appropriate odes are

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
Pounds	P	Kilograms	K
Tons	T	Metric Tons	M

If facility records use any other unit of measure for quantity the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste

D **Processes**

1 Process Codes

For listed dangerous waste For each listed dangerous waste entered in column A select the code(s) from the list of process codes contained in Section III to indicate how the waste will be stored treated and/or disposed of at the facility

For non listed dangerous wastes For each characteristic or toxic contaminant entered in Column A select the code(s) from the list of process codes contained in Section III to indicate all the processes that will be used to store treat and/or dispose of all the non listed dangerous wastes that possess that characteristic or toxic contaminant

Note Four spaces are provided for entering process codes If more are needed (1) Enter the first three as described above (2) Enter 000 in the extreme right box of item IV D(1) and (3) Enter in the space provided on page 4 the line number and the additional code(s)

2 Process Description If a code is not listed for a process that will be used describe the process in the space provided on the form

NOTE DANGEROUS WASTES DESCRIBED BY MORE THAN ONE DANGEROUS WASTE NUMBER Dangerous wastes that can be described by more than one Waste Number shall be described on the form as follows

1 Select one of the Dangerous Waste Numbers and enter it in column A On the same line complete columns B C and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat store and/or dispose of the waste

2 In column A of the next line enter the other Dangerous Waste Number that can be used to describe the waste In column D(2) on that line enter Included with above and make no other entries on that line

3 Repeat step 2 for each other Dangerous Waste Number that can be used to describe the dangerous waste

Example for completing Section IV (shown in line numbers X 1 X 2 X 3 and X-4 below) A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation In addition the facility will treat and dispose of three non listed wastes Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste

Line No	A Dangerous Waste No *(ente ode)*				B Estimated Annual Quantity of Waste	C Unit of Measure *(enter code)*			D Processes				
									1 Process Codes *(enter)*				2 Process Description *(if a code is not entered in D(1))*
X 1	*K*	*0*	*5*	*4*	*900*		*P*		*T03*	*D80*			
X 2	*D*	*0*	*0*	*2*	*400*		*P*		*T03*	*D80*			
X 3	*D*	*0*	*0*	*1*	*100*		*P*		*T03*	*D80*			
X 4	*D*	*0*	*0*	*2*					*T03*	*D80*			*Included with above*

Photocopy this page before completing if you have more than 26 wastes to list

I D Number *(enter from page 1)*										
W	A	7	8	9	0	0	0	8	9	6	7

IV DESCRIPTION OF DANGEROUS WASTES *(continued)*

Line No	A Dangerous Waste No *(enter code)*	B Estimated Annual Quantity of Waste	C Unit of Measure *(ente code)*	D Processes 1 Process Codes *(enter)*			D Processes 2 Process Description *(if a code is not entered in D(1))*
1	300 Area Waste Acid Treatment System						
2	D 0 0 1	2 086 525	K	T01	S02	T04	Tank Treatment/Tank-Storage/ Treatment Other (Phase Separation)
3	D 0 0 2		K	T01	S02	T04	
4	D 0 0 4		K	T01	S02	T04	
5	D 0 0 5		K	T01	S02	T04	
6	D 0 0 6		K	T01	S02	T04	
7	D 0 0 7		K	T01	S02	T04	
8	D 0 0 8		K	T01	S02	T04	
9	W T 0 2		K	T01	S02	T04	
10	D 0 0 9		K	T01	S02	T04	Included with above
11	D 0 0 7	907	K	T01			Treatment Tank (chem cal treatme t)
12	311 Tanks						
13	W T 0 2	2 086 525	K	T01	S02		Treatment Tank/Storage-Tank
14	D 0 0 2		K	T01	S02		
15	D 0 0 4		K	T01	S02		
16	D 0 0 5		K	T01	S02		
17	D 0 0 6		K	T01	S02		
18	D 0 0 7		K	T01	S02		
19	D 0 0 8		K	T01	S02		
20	D 0 0 9		K	T01	S02		Included with above
21							
22							
23							
24							
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26							
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44							
45							

IV DESCRIPTION OF DANGEROUS WASTE (continued)

E Use this space to list additional process codes from Section D(1) on page 3

The 300 WATS was used to treat both mixed and dangerous waste from fuels fabrication operations in the 333 Building and from nonroutine waste additions Treatment was performed to make the waste more amenable for further treatment and for storage The 333 Building waste primarily consisted of hydrofluoric acid nitric acid sulfuric acid and copper nitrate These routine waste types exhibited the dangerous waste characteristics of ignitability (D001) and corrosivity (D002) as the nitric acid is considered an oxidizer in accordance with Washington Administrative Code 173 303 Routine waste also was considered a state-only toxic dangerous waste (WT02) Additionally some of the routine waste was designated characteristic waste due to chromium (D007) Nonroutine waste added to the system included characteristic waste due to arsenic (D004) barium (D005) cadmium (D006) lead (D008) and mercury (D009) Approximately 2 086 525 kilograms (4 600 000 pounds) of waste were treated and stored yearly in this system Approximately 907 kilograms (2 000 pounds) of waste (D007 chromium VI to chromium III) were treated per year

The 311 tank system was used for the treatment and storage of waste This waste was effluent from the waste acid treatment and uranium recovery process This waste depending on the variations in the treatment process was considered mixed waste due to toxicity (WT02) Routine and nonroutine waste added to the waste acid treatment system included characteristic waste due to arsenic (D004) barium (D005) cadmium (D006) chromium (D007) lead (D008) and mercury (D009) The waste frequently had a pH greater than 12 5 which exhibits the dangerous waste characteristic of corrosivity (D002) Approximately 2 086 525 kilograms (4 600 000 pounds) of waste were treated and stored per year in the 311 tanks

V FACILIITY DRAWING Refer to attached drawing(s)

All existing facilities must include in the space provided on page 5 a scale drawing of the facility (see instructions for more detail)

VI PHOTOGRAPHS Refer to attached photograph(s)

All existing facilities must include photographs (aerial or ground level) that clearly delineate all existing structures existing storage treatment and disposal areas and sites of future storage treatment or disposal areas (see instructions for more detail)

VII FACILITY GEOGRAPHIC LOCATION This information is provided on the attached drawings and photos

LATITUDE *(degrees minutes & seconds)*			LONGITUDE *(degrees minutes & seconds)*		
46	22	18	119	16	42

VIII FACILITY OWNER

☒ A If the facility owner is also the facility operator as listed in Section VII on Form 1 General Information place an X in the box to the left and skip to Section XI below

B If the facility owner is not the facility operator as listed in Section VII on Form 1 complete the following items

1 Name of Facility s Legal Owner	2 Phone Number *(ea de &)*

3 Street or P O Box	4 City or Town	5 St	6 Zip Code

IX OWNER CERTIFICATION

I cert fy u de pe alty of law that I ha e pe so ally exami ed a d am familia with the information s bmitted in this a d all attached document and that b d o ty i q iry of those ind idu l im ediately e ponsible fo obta ng the info mation I b lieve that the submitted informatio is true acc ate and compl t I am awa e that the e ar sign ficant pen lt es fo submitting false nformatio including the pos ibility of f ne and imp isonm nt

Name *(print or type)*	Signature	Date Signed
John D Wagoner Manager U S Department of Energy Richland Operations Office	John D Wagoner	Revision 5 signed 09/26/96

X OPERATOR CERTIFICATION

I e tify nder penalty of law that I have per nally exam ed a d am familia with the info mat on s bmitt d in th and all attached docum t d th t ba d my q ry of tho nd dual mmediately esponsible for obtaining the information I believe that the ubm tted i format n true ccu ate a d complete I m aw e that the a e s gnf cant p nalt es fo s bmit ng false info mation incl ding the possibil ty of f e a d imp sonm t

Name *(Print Or Type)*	Signature	Date Signed
See attachment		

X OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the submitted 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

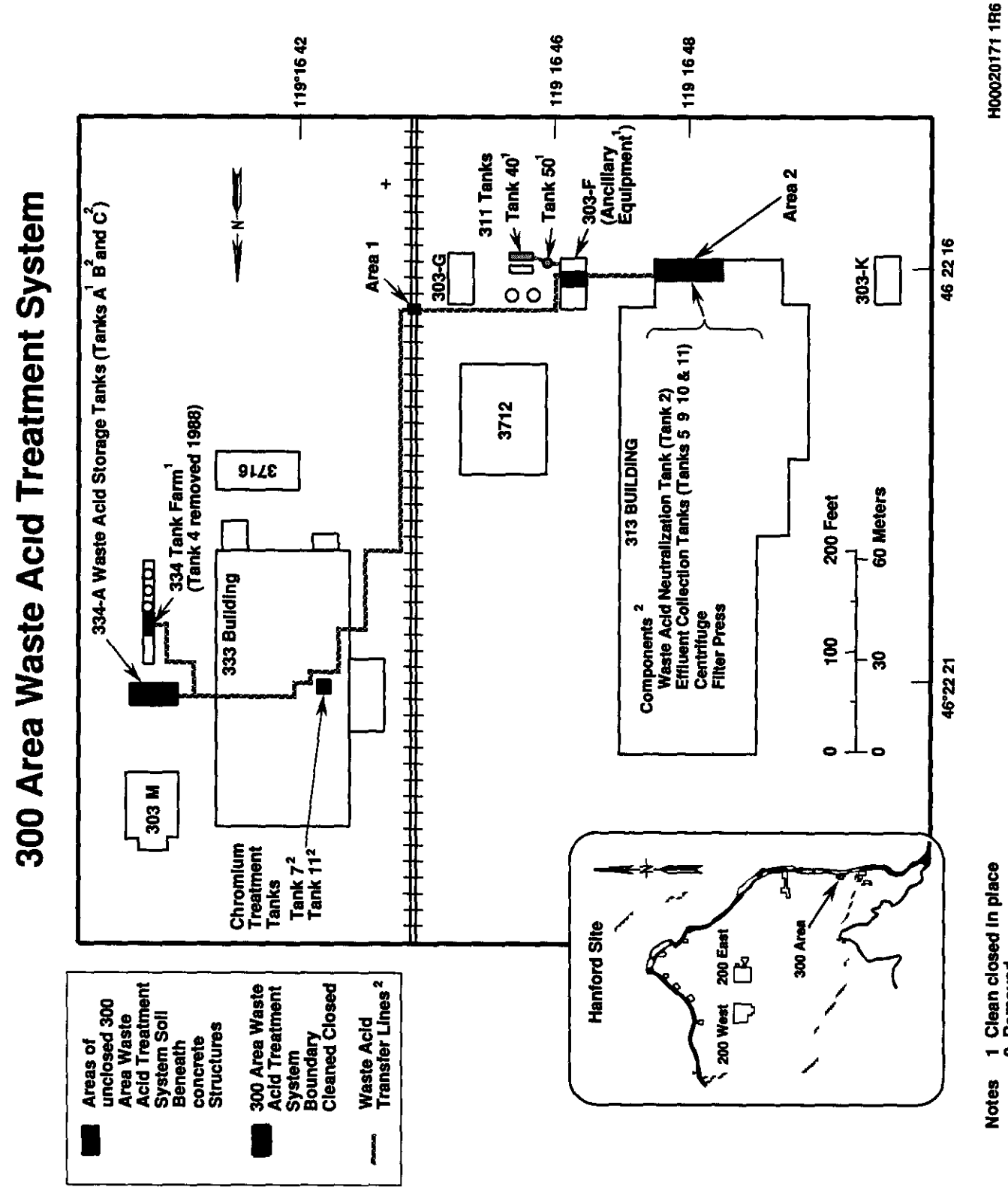
John D Wagoner
Owner/Operator
John D Wagoner Manager
U S Department of Energy
Richland Operations Office

09/26/96
Date Revision 5 Signed

H J Hatch
Co Operator
H J Hatch
President and Chief Executive Officer
Fluor Daniel Hanford Inc

09/13/96
Date Revision 5 Signed

Figure


300 Area Waste Acid Treatment System
334-A Waste Acid Storage Tanks (Tanks A[1] B[2] and C[2])
334 Tank Farm[1] (Tank 4 removed 1988)
333 Building
3716
303 M
Chromium Treatment Tanks
Tank 7[2]
Tank 11[2]
Area 1
303-G
311 Tanks
Tank 40[1]
Tank 50[1]
303-F (Ancillary Equipment[1])
Area 2
3712
313 BUILDING
Components[2]
Waste Acid Neutralization Tank (Tank 2)
Effluent Collection Tanks (Tanks 5 9 10 & 11)
Centrifuge
Filter Press
303-K
119°16 42
119 16 46
119 16 48
46 22 16
46°22 21
0
100
200 Feet
0
30
60 Meters
N
Areas of unclosed 300 Area Waste Acid Treatment System Soil Beneath concrete Structures
300 Area Waste Acid Treatment System Boundary Cleaned Closed
Waste Acid Transfer Lines[2]
Hanford Site
200 West
200 East
300 Area
H000201711R6
Notes 1 Clean closed in place
2 Removed

300 Area Waste Acid Treatment System

Substructure Soil Contamination Location - Area 1

00070107-6CN
(PHOTO TAKEN 2000)

Substructure Soil Contamination Location - Area 2

00070107 2CN
(PHOTO TAKEN 2000

FORM 3 | **DANGEROUS WASTE PERMIT APPLICATION** | I EPA/State I D No: W A 7 8 9 0 0 0 8 9 6 7

)R OFFICIAL USE ONLY

Application Approved	Date Received (month/ day / year)	Comments
		Closed – Capacity transferred to the 300 Area Waste Acid Treatment System 6/29/90

II FIRST OR REVISED APPLICATION

Place an X in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application If this is your first application and you already know your facility s EPA/STATE I D Number or If this is a revised application enter your facility s EPA/STATE I D Number in Section I above

A. First Application (place an X below and provide the appropriate date)

☐ 1 **Existing Facility** (See instructions for definition of existing facility Complete item below)

MO	DAY	YEAR
03	01	1973

For existing facilities, provide the date (mo/day/yr) operation began or the date construction commenced (use the boxes to the left)
The date construction of the Hanford Facility commenced

☐ 2 **New Facility** (Complete item below)

MO	DAY	YEAR

For new facilities provide the date (mo/day/yr) operation began or is expected to begin

B Revised Application (Place an X below and complete Section I above)

☒ 1 **Facility has an interim Status Permit**

☒ 2 **Facility has a Final Permit**

III PROCESSES – CODES AND DESIGN CAPACITIES

A. Process Code – Enter the code from the list of process codes below that best describes each process to be used at the facility Ten lines are provided for entering codes If more lines are needed, enter the codes(s) in the space provided If a process will be used that is not included in the list of codes below then describe the process (including its design capacity) in the space provided on the (Section III-C)

B Process Design Capacity – For each code entered in column A enter the capacity of the process

1 Amount – Enter the amount

2 Unit of Measure – For each amount entered in column B(1) enter the code from the list of unit measure codes below that describes the unit of measure used Only the units of measure that are listed below should be used

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
STORAGE		
Container (barrel drum, etc)	S01	Gallons or liters
Tank	S02	Gallons or liters
Waste pile	S03	Cubic yards or cubic meters
Surface impoundment	S04	Gallons or liters
	S06	Cubic yards or cubic meters
DISPOSAL		
Injection well	D80	Gallons or liters
Landfill	D81	Acre feet (the volume that would cover one acre to a Depth of one foot) or hectare meter
Land application	D82	Acres or hectares
Ocean disposal	D83	Gallons per day or liters per day
Surface impoundment	D84	Gallons or liters
TREATMENT		
Tank	T01	Gallons per day or liters per day
Surface impoundment	T02	Gallons per day or liters per day
Incinerator	T03	Tons per hour or metric tons per hour gallons per hour or liters per hour
Other (use for physical chemical thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators Describe the processes in the space provided Section III-C)	T04	Gallons per day or liters per day

Unit of Measure	Unit of Measure Code	Unit of Measure	Unit of Measure Code	Unit of Measure	Unit of Measure Code
Gallons	G	Liters Per Day	V	Acre Feet	A
Liters	L	Tons Per Hour	D	Hectare Meter	F
ıbic Yards	Y	Metric Tons Per Hour	W	Acres	B
bic Meters	C	Gallons Per Hour	E	Hectares	Q
allons Per Day	U	Liters Per Hour	H		

III. PROCESS – CODES AND DESIGN CAPACITIES (continued)

Example for Completing Section III (shown in line numbers X-1 and X-2 below): A facility has two storage tanks; one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

Line No.	A. Process Code *(from list above)*			B. process Design Capacity				For Official Use Only			
				1. Amount *(Specify)*		2. Unit of Measure *(enter code)*					
X-1	*S*	*0*	*2*	*600*		*G*					
X-2	*T*	*0*	*3*	*20*		*E*					
1	T	0	1	5,000		U					
2	S	0	2	9,000		G					
3											
4											
5											
6											
7											
8											
9											
10											

C. Space for additional process codes or for describing other process (code "T04"). For each process entered here include design capacity.

T01, S02

The 311 Tanks are used for the storage of the treatment effluents from both the 300 Area waste acid treatment process and the 300 Area uranium recovery process. Storage occurs on the two tanks with capacities of 4,000 and 5,000 gallons, respectively. These tanks are constructed of stainless steel. The 5,000 gallon tank is also occasionally used for decanting wastes when the solids content is too high. This tank is capable of treating up to 5,000 gallons/day, but is used for decanting on an infrequent basis.

IV. DESCRIPTION OF DANGEROUS WASTES

A. **Dangerous Waste Number** – Enter the digit number from Chapter 173-303 WAC for each listed dangerous waste you will handle. If you handle dangerous wastes which are not listed in Chapter 173-303 WAC, enter the four-digit number(s) that describes the characteristics and/or the toxic contaminants of those dangerous wastes.

B. **Estimated Annual Quantity** - For each listed waste entered in column A, estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A, estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. **Unit of Measure** - For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate odes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
Pounds	P	Kilograms	K
Tons	T	Metric Tons	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. **Processes**

1. Process Codes:

For listed dangerous waste: For each listed dangerous waste entered in column A select the code(s) from the list of process codes contained in Section III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed dangerous wastes: For each characteristic or toxic contaminant entered in Column A, select the code(s) from the list of process codes contained in Section III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed dangerous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. Process Description: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: DANGEROUS WASTES DESCRIBED BY MORE THAN ONE DANGEROUS WASTE NUMBER - Dangerous wastes that can be described by more than one Waste Number shall be described on the form as follows:

1. Select one of the Dangerous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other Dangerous Waste Number that can be used to describe the waste. In column D(2) on that line enter "Included with above" and make no other entries on that line.
3. Repeat step 2 for each other Dangerous Waste Number that can be used to describe the dangerous waste.

Example for completing Section IV (shown in line numbers X-1, X-2, X-3, and X-4 below) - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste.

Line No.	A. Dangerous Waste No. *(enter code)*	B. Estimated Annual Quantity of Waste	C. Unit of Measure *(enter code)*	D. Processes	
				1. Process Codes *(enter)*	2. Process Description *(if a code is not entered in D(1))*
X-1	K 0 5 4	900	P	T03 D80	
X-2	D 0 0 2	400	P	T03 D80	
X-3	D 0 0 1	100	P	T03 D80	
X-4	D 0 0 2			T03 D80	Included with above

Photocopy this page before completing if you have more than 26 wastes to list

ID Number *(enter from page 1)*										
W	A	7	8	9	0	0	0	8	9	6	7

IV DESCRIPTION OF DANGEROUS WASTES *(continued)*

Line No	A Dangerous Waste No *(enter code)*				B Estimated Annual Quantity of Waste	C Unit of Measure *(enter code)*			D Processes 1 Process Codes *(ente)*				D Processes 2 Process Description *(if a code is not entered in D(1))*
1	W	T	0	2	4 000 000		P		T01	S01			Decanting/Storage
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
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39													
40													
41													
42													

IV DESCRIPTION OF DANGEROUS WASTE (continued)

Use this space to list additional process codes from Section D(1) on page 3

The 311 Tanks are used for the treatment and storage of radioactive mixed wastes These wastes are the effluents from the waste acid treatment and the uranium recovery process These wastes may depending upon variations in the treatment process be considered dangerous wastes due to the toxicity under the mixture rule Approximately 4 000 000 pounds of waste are in the tanks each year

V FACILIITY DRAWING Refer to attached drawing(s)

All existing facilities must include in the space provided on page 5 a scale drawing of the facility (see instructions for more detail)

VI PHOTOGRAPHS Refer to attached photograph(s)

All existing facilities must include photographs (aerial or ground level) that clearly delineate all existing structures existing storage treatment and disposal areas and sites of future storage treatment or disposal areas (see instructions for more detail)

VII FACILITY GEOGRAPHIC LOCATION This information is provided on the attached drawings and photos

LATITUDE *(degrees minutes & seconds)*			LONGITUDE *(degrees minutes & seconds)*		
46	22	18	119	16	42

VIII FACILITY OWNER

☒ A. If the facility owner is also the facility operator as listed in Section VII on Form 1 General Information place an X in the box to the left and skip to Section XI below

B If the facility owner is not the facility operator as listed in Section VII on Form 1 complete the following items

1 Name of Facility s Legal Owner	2 Phone Number *(area code & no)*

3 Street or P O Box	4 City or Town	5 St	6 Zip Code

IX OWNER CERTIFICATION

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

Name *(print or type)*	Signature	Date Signed
Michael J Lawrence Manager U S Department of Energy Richland Operations Office	Michael J Lawrence	Revision 1 signed 11/16/87

X OPERATOR CERTIFICATION

I cert fy under penalty of law that I ha e personally exam ned and am fam lia with the nformation subm tted in this and all attached documents and that based on my inquiry of tho e indi iduals immediately responsible for obtaining the informati n I bel eve that the ubmitted nformation is true accurate and complete I am awa e that there are significant penalties fo submitting false information includ ng the possibility of fine and imp isonment

Name *(Print Or Type)*	Signature	Date Signed
e attachment		

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents and that based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the submitted 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

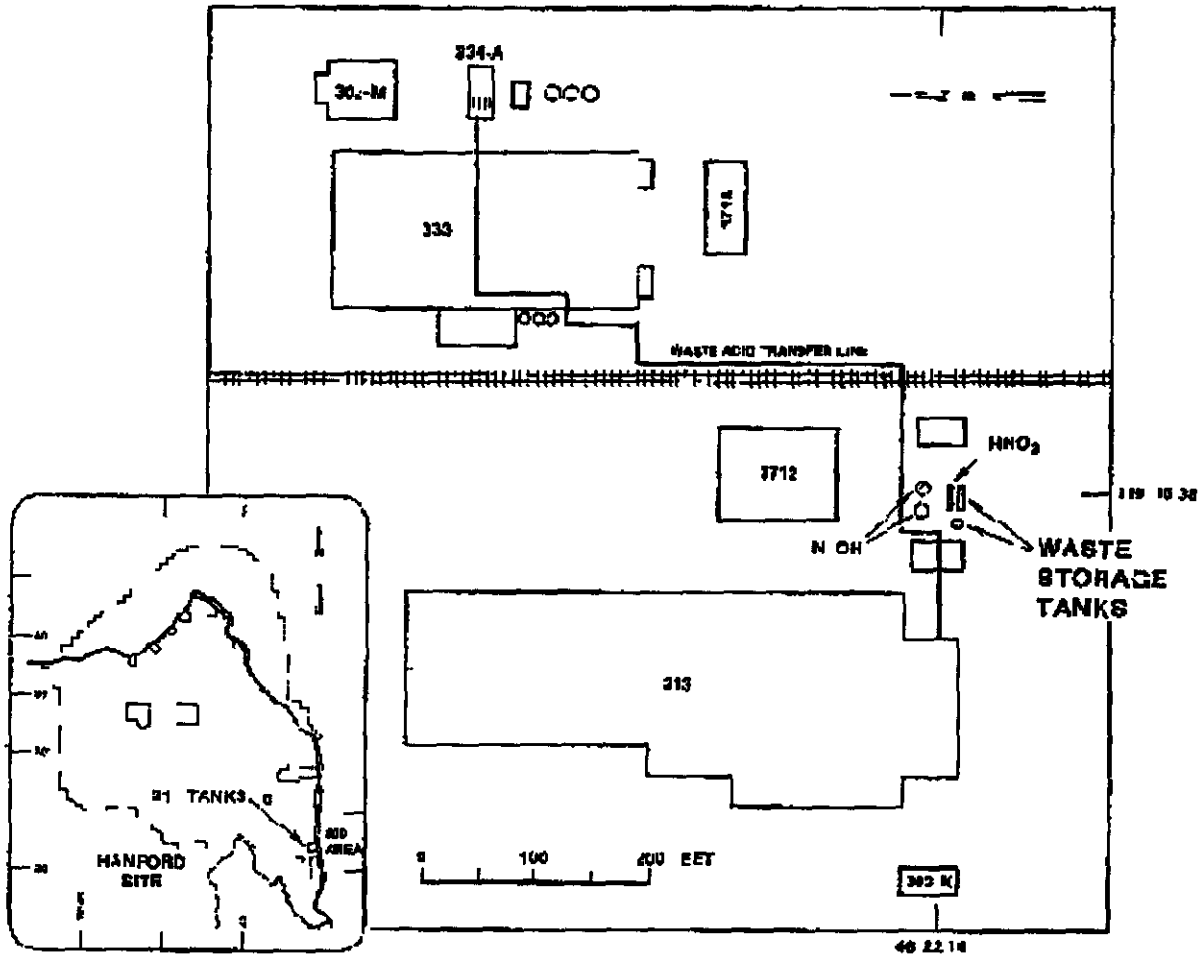
Michael J Lawrence
Owner/Operator
Michael J Lawrence Manager
U S Department of Energy
Richland Operations Office

11/16/87
Date Revision 1 Signed

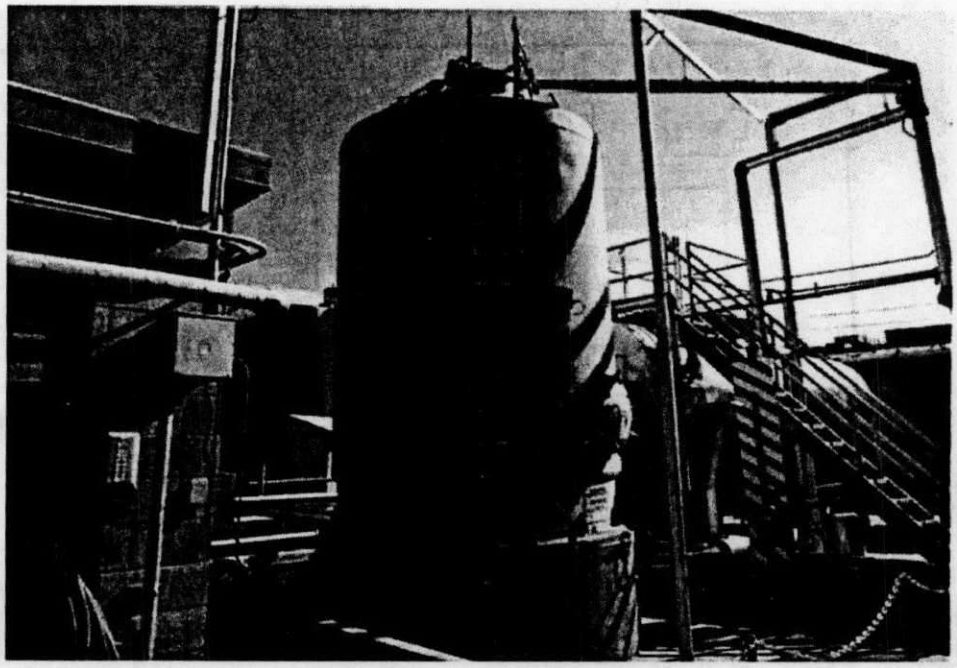
William M Jacobi
Co Operator
William M Jacobi President
Westinghouse Hanford Company

11/16/87
Date Revision 1 Signed

Figure

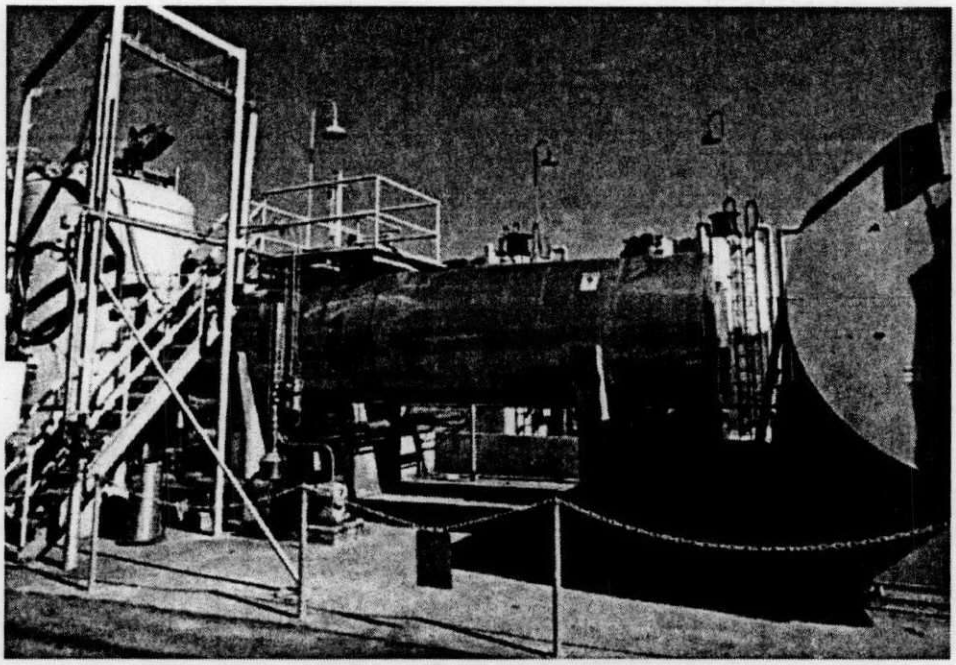

334-A
333
3712
WASTE ACID TRANSFER LINE
HNO_3
N OH
WASTE
STORAGE
TANKS
313
TANKS
HANFORD
SITE
100
400 FEET

311 Tank Farm



WASTE STORAGE TANKS
46°22'14"
119°16'38"

8704479-7CN
(PHOTO TAKEN 1987)



WASTE STORAGE TANKS

46o22'14"
119o16'38"

8704470-8CN
(PHOTO TAKEN 1987)