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RESOURCE CONSERVATION AND RECOVERY ACT
DRAFT HAZARDOUS WASTE FACILITY PERMIT

WASTE ISOLATION PILOT PLANT (WIPP)

ATTACHMENTS:

Volume III of IV

EPA I.D. Number: NM4890139088

U.S. Department of Energy (DOE); and
Westinghouse Electric Corporation,
Waste Isolation Division (WID)

DISCLAIMER

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Issued by New Mexico Environment Department

August 1993

Engineering drawings for this project
are identified as CAPE-3068
Inquiries may be directed to:

Office of Scientific and
Technical Information
P. O. Box 92
Oak Ridge, TN 37831

MASTER

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**RESOURCE CONSERVATION AND RECOVERY ACT
DRAFT HAZARDOUS WASTE FACILITY PERMIT**

LIST OF ATTACHMENTS

VOLUME I OF IV

MODULE I

No Attachments for this Module

MODULE II

- II-1 Waste Analysis Plan (as modified in this permit)
- II-2 Quality Assurance Program Plan for the Waste Isolation Pilot Plant
Experimental Waste Characterization Program (QAPP)
- II-3 WIPP Waste Characterization Sampling and Analysis Guidance Manual (Plan)
(SAP)
- II-4 No Migration Determination Requirement Summary (NMD)

VOLUME II OF IV

MODULE II (Con't)

- II-5 Part A Permit Application
- II-6 Examples of Acceptable Documentation
- II-7 Waste Isolation Pilot Plant Generator/Storage Site Waste Screening and
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- II-8 Inspection Schedule and Monitoring Schedule
- II-9 Inspection Log Forms
- II-10 Personnel Training Course Outlines
- II-11 Hazardous Waste Job Position Training Requirements
- II-12 Contingency Plan

**RESOURCE CONSERVATION AND RECOVERY ACT
DRAFT HAZARDOUS WASTE FACILITY PERMIT**

LIST OF ATTACHMENTS (Con't)

MODULE II (Con't)

- II-13 Closure Plan
- II-14 Procedures for Establishing Background for the Underground Units

MODULE III

- III-1 Facility Process Information

VOLUME III OF IV

MODULE III (Con't)

- III-2 Test Bin Design Drawings
- III-3 SWB/RCB Design Drawings
- III-4 Waste Handling Building Secondary Containment System Drawings
- III-5 Test Bin Flammable Gas Concentration Control System Drawings

MODULE IV

- IV-1 Carbon Sorption Bed Design Calculations

VOLUME IV OF IV

MODULE IV (Con't)

- IV-2 VOC Monitoring Plan for Bin-Room Tests (Appendix D12)
- IV-3 Bin Emission Control and VOC Monitoring System Drawings
- IV-4 Bin Scale Test Room Ventilation Drawings
- IV-5 WIPP Supplementary Roof Support System, Underground Storage Area, Room 1, Panel 1, DOE/WIPP 91-057
- IV-6 WIPP Supplementary Roof Support System, Room 1, Panel 1, Geotechnical Field Data Analysis Bi-Annual Report, DOE/WIPP 92-024

DRAFT

ATTACHMENT III-2
TEST BIN DESIGN DRAWINGS

ECO 6246

DRAFT

DRAFT Page

Page 1 of 5

USE BLACK INK

1. ECO No.: <u>6246</u> CC&D Review: <u>RJ</u>		2. Impact Level 1 ☐ 2 ☒ 3 ☐ 4 ☐	
		3. System: <u>WHOG</u> Equipment No.: <u>N/A</u> Building: <u>U/G</u>	
4. Associated Documents: PWR <u>NIA</u> ECP <u>↓</u> P.O. <u>3877 EX</u> Others _____		5. Document Type: Drawing <u>412-F-017-W</u> ☒ <u>412-N-002-W</u> ☐ Specification ☐ Vendor Data ☐ SDD ☐ Others _____	
6. Title of Change: <u>BIN ASSY. - GASKET CHANGE</u>			
7. Originator: (print) <u>OM MENDIRATTA</u>		Ext. No.: <u>8377</u> Department: <u>M & CE</u> Date: <u>6/10/92</u>	
		8. Cognizant Engineer: (print) <u>OM MENDIRATTA</u>	
9. Description of Change: <div style="display: flex; justify-content: space-between;"> DWG. <u>412-F-017-W, B.O.M.</u> <div style="text-align: center;"> Yes ☐ No ☒ </div> Component indices change required (if yes, attach sheets) </div> <p>Revised #12 Material to Hycar (instead of Buna-N).</p> <p>Added a note to #12 "Existing bins will be retrofit with Hycar gasket before shipment to generator sites".</p> <p>DWG. <u>412-N-002-W</u></p> <p>Revised note #18 to include bins PB-009 through -011 only.</p> <p>Added a note "Bin Lid Bolting Procedure WP 09-BN1200 shall be implemented for making a leak tight connection".</p> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> ☒ 9a Drawing Change Sheet attached ☐ 9b Design Documentation Sheet attached </div> <div> ☐ 9c Vendor Data Change Sheet attached </div> </div>			
10. Yes No <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> ☒ ☐ MODIFICATION IN PROGRESS ☒ Modification complete: <u>[Signature]</u> <u>9/30/92</u> <div style="display: flex; justify-content: space-around; font-size: small;"> Signature Date </div> </div> <div style="flex-grow: 1; border-left: 1px solid black; padding-left: 10px;"> ECO will be incorporated after M.I.P. signed complete </div> </div> <div style="margin-top: 10px;"> ☐ Change drawing per addendum dated: _____ ☒ Change drawing per ECO-provided data ☐ Temporary modification </div>			
11. Design Verification Requirements: (per WP 09-018) EDT No.: _____ <div style="display: flex;"> <div style="flex: 1;"> <u>[Signature]</u> _____ _____ _____ _____ _____ </div> <div style="flex: 2;"> 1. Requirements satisfied by review/approval of design document 2. Independent review 3. Alternate calculations 4. Development testing 5. Design review 6. Other: _____ </div> </div>			
12. Addendum Sheet added: _____ <div style="display: flex; justify-content: space-between; font-size: x-small; margin-top: 5px;"> Signature Date </div>			

13. Justification

Gasket material change resulted from R & D work by the SNL and the WID and was authorized by WPSO-CCB Action; Bin botting procedure has been instituted to provide a consistent approach in obtaining a leak tight bin/bin lid assembly, the procedure was developed and implemented at WPSO request.

14. Administrative Tracking

YES N/A

- ☐ ☒ 1. FSAR
☐ ☒ 2. Calibration Procedures
☐ ☒ 3. Maintenance Procedures
☐ ☒ 4. Computer Software
☒ ☐ 5. Operations Procedures

YES N/A

- ☐ ☒ 6. Startup/Acceptance Test
☐ ☒ 7. Test Requirement & Spec.
☐ ☒ 8. SDD
☐ ☐ 9. _____
☐ ☐ 10. _____

15. Signature Requirements

Impact
LevelKEY
A=APPR.
R=REVIEW
S=SIGN NEW
DRAWING

4	☐ A	Cog. Engineer	<i>Am Indurita</i> 6/10/92
	☐ A	Cog. Manager	<i>J. P. Ball</i> 6/10/92
	☐ R	Startup	<i>Di Grant</i> 6/10/92
3	☐	QA	<i>R. P. Ball</i> 6/10/92
	☐	Cog. Ops. Mgr.	<i>Y. P. Ball</i> 6/12/92
	☐	DOE	<i>Y. P. Ball</i> 6/10/92
2	☐	Safety	<i>Y. P. Ball</i> 6/10/92
	☐	Maintenance	
	☐	Dept. Manager	
	☐	Asst. Gen. Mgr.	
	☐	Operations	<i>J. P. Ball</i> 6/10/92
	☒ A	SNL	<i>A. P. Ball</i> 6/10/92
	☐		
	☐		
	☐		

16. Distribute as Marked

- ☒ Maintenance (MANDATORY) _____
☒ Ops. Support _____
☒ Startup _____
☐ Facility Operations _____
☒ U/G Operations _____
☒ Orig./Design Engr. _____
☒ Cog. Engineer _____
☐ Others _____
☒ Howard Leos Jr _____
☒ SNL - A. Dyrell _____
☐ _____
☐ _____
☐ _____
☐ _____
☐ _____

ENGINEERING CHANGE ORDER

DOE ORDER 6430.1A DESIGN CRITERIA

CHECKLIST

PAGE 3 OF 5
 1. ECO # 6246
 2. DATE: 6/10/92

DRAFT

The design requirements in DOE Order 6430.1A checked below
 have been applied to this Design.

DIVISION	SUBDIVISION
1 General Requirements	☐ 0101 ☐ 0106 ☐ 0109 ☐ 0110 ☐ 0111 ☐ 0140 ☐ 0150 ☐ 0170
2 Site and Civil Engineering	☐ 0200 ☐ 0201 ☐ 0202 ☐ 0203 ☐ 0205 ☐ 0210 ☐ 0214 ☐ 0215 ☐ 0220 ☐ 0235 ☐ 0245 ☐ 0250 ☐ 0256 ☐ 0260 ☐ 0262 ☐ 0266 ☐ 0267 ☐ 0270 ☐ 0273 ☐ 0275 ☐ 0276 ☐ 0278 ☐ 0279 ☐ 0280 ☐ 0281 ☐ 0283 ☐ 0285 ☐ 0290 ☐ 0291
3 Concrete	☐ 0300 ☐ 0301 ☐ 0310 ☐ 0320 ☐ 0330 ☐ 0340 ☐ 0350 ☐ 0370 ☐ 0380
4 Masonry	☐ 0400 ☐ 0401 ☐ 0410 ☐ 0420 ☐ 0455
5 Metals	☐ 0500 ☐ 0512 ☐ 0514 ☐ 0521 ☐ 0531 ☐ 0532
6 Wood and Plastics	☐ 0600 ☐ 0610 ☐ 0650
7 Thermal and Moisture Protection	☐ 0710 ☐ 0711 ☐ 0714 ☐ 0715 ☐ 0719 ☐ 0720 ☐ 0721 ☐ 0722 ☐ 0724 ☐ 0727 ☐ 0730 ☐ 0750 ☐ 0751 ☐ 0753 ☐ 0760 ☐ 0790
8 Doors and Windows	☐ 0800 ☐ 0810 ☐ 0820 ☐ 0830 ☐ 0833 ☐ 0836 ☐ 0839 ☐ 0850 ☐ 0860 ☐ 0870 ☐ 0880
9 Finishes	☐ 0900 ☐ 0910 ☐ 0920 ☐ 0925 ☐ 0930 ☐ 0950 ☐ 0965 ☐ 0968 ☐ 0970 ☐ 0980 ☐ 0990 ☐ 0995
10 Specialties	☐ 1015 ☐ 1020 ☐ 1024 ☐ 1027 ☐ 1030 ☐ 1040 ☐ 1050 ☐ 1052 ☐ 1053 ☐ 1055 ☐ 1060 ☐ 1065 ☐ 1070 ☐ 1075 ☐ 1080
11 Equipment	☐ 1100 ☐ 1161
12 Furnishings	☐ 1201 ☐ 1230 ☐ 1250 ☐ 1260 ☐ 1270
13 Special Facilities	☐ 1300 ☐ 1304 ☐ 1305 ☐ 1306 ☐ 1307 ☐ 1318 ☐ 1319 ☐ 1320 ☐ 1321 ☐ 1322 ☐ 1323 ☐ 1324 ☐ 1325 ☐ 1326 ☐ 1328
14 Conveying Systems	☐ 1401 ☐ 1420 ☐ 1440 ☐ 1460
15 Mechanical	☐ 1525 ☐ 1530 ☐ 1540 ☐ 1550 ☐ 1555 ☐ 1565 ☐ 1574 ☐ 1589 ☐ 1595
16 Electrical	☐ 1600 ☐ 1605 ☐ 1620 ☐ 1630 ☐ 1639 ☐ 1640 ☐ 1650 ☐ 1655 ☐ 1660 ☐ 1670 ☐ 1671 ☐ 1685 ☐ 1694
17 NOT APPLICABLE	No portion of DOE Order 6430.1A is applicable to this Design.
18 AS-BUILT	ECO is for as-built field verified changes only.

Gen R. Pendleton
6/10/92

NOTE: A check placed in the Division column signifies that the entire Division shall be applicable to the Design, unless modified by checks indicated for specific Subdivisions.

COMMENTS: _____

9a
DRAWING CHANGE SHEET
(1 SHEET PER DRAWING)

DRAFT

Page 4 of 5

1. Drawing: 412 - F - 017 - W ECO Number: 6246

2. ECO Search List:

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. Description of Change:

Revised #12 material to Hycar (instead of
Buna-N)

Added a note to #12 "Existing bins
will be retrofit with Hycar gasket
before shipment to generator sites".

4. Drawing Cog. Engineer Approval

Deviendia

Date: 6/10/92

9a
DRAWING CHANGE SHEET
(1 SHEET PER DRAWING)

DRAFT

Page 5 of 5

1. Drawing: 412-N-002-W

ECO Number: 6246

2. ECO Search List:

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. Description of Change:

Revised note #18 to include bins PB-009 through -011 only.

Added a note " Bin Lid Bolting Procedure WPO9 - BN 1200 shall be implemented for making a leak tight connection".

4. Drawing Cog. Engineer Approval:

Don J. Davis

Date:

6/10/92

DRAFT

ECO 6388

ENGINEERING CHANGE ORDER

9/14/92 H 12

USE BLACK INK

Page 1 of 8

1. ECO No.: <u>6388</u>		2. Impact Level 1 ☐ 2 ☒ 3 ☒ 4 ☐		advised 9/15/92	
3. System: <u>WHO28</u> Equipment No.: <u>N/A</u> Building: <u>U/G PWH</u>					
4. Associated Documents:		5. Document Type: <u>412-N-002-W</u>			
PWR <u>N/A</u>		Drawing <u>412-F-017-W1</u> ☒			
ECP <u>N/A</u>		Specification <u>D-0084</u> ☒			
P.O. <u>N/A</u>		Vendor Data ☐			
Others <u>N/A</u>		SDD ☐			
		Others ☐			
6. Title of Change: <u>UPGRADE TO CURRENT CONFIGURATION</u>					

DRAFT

7. Originator: (print) <u>A.A. CHAWLA</u>	Ext. No.: <u>402B</u>	Department: <u>TEST PROGRAMS</u>	Date: <u>9/8/92</u>	8. Cognizant Engineer: (print) <u>M.E. HERRERA</u>
--	-----------------------	----------------------------------	---------------------	---

9. Description of Change:

9.1 DRAWINGS

1 9.1.1 412-N-002-W (REV-F)

i) Revised item no. 3B

ii) Revised detail no. 4

iii) Added Δ to note no. 17

iv) Revised note no. 2

v) Revised detail no. 2

vi) Added note no. 24

vii) Made values notes part of drawing notes

Yes ☐ No ☒ Component indices change required (if yes, attach sheets)

9a ☒ Drawing Change Sheet attached

9b ☒ Design Documentation Sheet attached

9c ☐ Vendor Data Change Sheet attached

10. Yes ☐ No ☒ **MODIFICATION IN PROGRESS**

Modification complete: _____

Signature _____ Date _____

ECO will be incorporated after M.I.P. signed complete

☐ Change drawing per addendum dated: _____

☐ Change drawing per ECO-provided data

☐ Temporary modification

11. Design-Verification Requirements: (per WP 09-018) EDT No.: _____

AKB

1. Requirements satisfied by review/approval of design document

2. Independent review

3. Alternate calculations

4. Development testing

5. Design review

6. Other: _____

12. Addendum Sheet added: _____

Signature _____ Date _____

13. Justification *upgrading and necessary corrections.*

*TO PROVIDE CURRENT DETAIL CONFIGURATION
FOR BEN EQUIPMENT*

DRAFT

14. Administrative Tracking

YES N/A

- ☐ ☒ 1. FSAR
- ☐ ☒ 2. Calibration Procedures
- ☐ ☒ 3. Maintenance Procedures
- ☐ ☒ 4. Computer Software
- ☒ ☐ 5. Operations Procedures

YES N/A

- ☐ ☒ 6. Startup/Acceptance Test
- ☐ ☒ 7. Test Requirement & Spec.
- ☐ ☒ 8. SDD
- ☐ ☐ 9. _____
- ☐ ☐ 10. _____

15. Signature Requirements

KEY
A=APPR.
R=REVIEW
S=SIGN NEW
DRAWING

Impact
Level

	☒ A	Cog. Engineer	<i>M. e. Herera</i> 9/8/92
	☒ A	Cog. Manager	<i>M. e. Herera</i> 9/14/92
	☐ R	Startup	<i>Combined</i> 9-16-92
3	☒ A	QA	<i>H. Lerch</i> 9/18/92
	☐	Cog. Ops. Mgr.	
	☐	DOE	
2	☐	Safety	
	☐	Maintenance	
	☐	Dept. Manager	
	☐	Asst. Gen. Mgr.	
	☐	Operations	
	☒ A	SNL	
	☐		
	☐		
	☐		

16. Distribute as Marked

☒	Maintenance (MANDATORY)	<i>x W. DELL T. JONES</i>
☒	Ops Support	
☒	Startup	
☐	Facility Operations	
☒	U/G Operations	
☒	Org./Design Engr.	
☒	Cog. Engineer	<i>x M. HERBERA</i>
☐	Others	
☒		<i>HOWARD LEOS JR. x</i>
☒		<i>SNL: A. ORRILL MC 9.8.92</i>
☐		
☐		
☐		
☐		
☐		

ENGINEERING CHANGE ORDER

Continuation Sheet

Document Number:

DRAFT

ECO

Date: 9/8/92

Page

3

of

8

M.H.

M.H. 9/14/92

#12

9/14/92

6388

9.1.2 412-F-017-W1 (REV. F)

i) Change elevation title

ii) Add ASTM Specification no. to item no. 26

9.1.3 412-N-003-W1

i) Add Standard thickness dimension to plate hook, item #18

9.2 SPECIFICATION

SPEC. NO. D-0084 (REV. 2)

Change statement for minimum burst pressure of the rupture disc per attached sheet, page 8/12 M.H. 9/14/92

ENGINEERING CHANGE ORDER

DOE ORDER 6430.1A DESIGN CRITERIA

CHECKLIST

DRAFT

m.d.
9/14/92
4
PAGE 3 OF 8
1. ECO # 6388
2. DATE: 9/18/92

The design requirements in DOE Order 6430.1A checked below have been applied to this Design.

3. IV DIVISION	SUBDIVISION
☐ 1 General Requirements	☐ 0101 ☐ 0106 ☐ 0109 ☐ 0110 ☐ 0111 ☐ 0140 ☐ 0150 ☐ 0170
☐ 2a Site and Civil Engineering	☐ 0200 ☐ 0201 ☐ 0202 ☐ 0203 ☐ 0205 ☐ 0210 ☐ 0214 ☐ 0215 ☐ 0220 ☐ 0235 ☐ 0245 ☐ 0250 ☐ 0256 ☐ 0260 ☐ 0262 ☐ 0266 ☐ 0267 ☐ 0270 ☐ 0273 ☐ 0275 ☐ 0276 ☐ 0278 ☐ 0279 ☐ 0280 ☐ 0281 ☐ 0283 ☐ 0285 ☐ 0290 ☐ 0291
☐ 3a Concrete	☐ 0300 ☐ 0301 ☐ 0310 ☐ 0320 ☐ 0330 ☐ 0340 ☐ 0350 ☐ 0370 ☐ 0380
☐ 4a Masonry	☐ 0400 ☐ 0401 ☐ 0410 ☐ 0420 ☐ 0455
☐ 5 Metals	☐ 0500 ☐ 0512 ☐ 0514 ☐ 0521 ☐ 0531 ☐ 0532
☐ 6a Wood and Plastics	☐ 0600 ☐ 0610 ☐ 0650
☐ 7 Thermal and Moisture Protection	☐ 0710 ☐ 0711 ☐ 0714 ☐ 0715 ☐ 0719 ☐ 0720 ☐ 0721 ☐ 0722 ☐ 0724 ☐ 0727 ☐ 0730 ☐ 0750 ☐ 0751 ☐ 0753 ☐ 0760 ☐ 0790
☐ 8a Doors and Windows	☐ 0800 ☐ 0810 ☐ 0820 ☐ 0830 ☐ 0833 ☐ 0836 ☐ 0839 ☐ 0850 ☐ 0860 ☐ 0870 ☐ 0880
☐ 9 Finishes	☐ 0900 ☐ 0910 ☐ 0920 ☐ 0925 ☐ 0930 ☐ 0950 ☐ 0965 ☐ 0968 ☐ 0970 ☐ 0980 ☐ 0990 ☐ 0995
☐ 10a Specialties	☐ 1015 ☐ 1020 ☐ 1024 ☐ 1027 ☐ 1030 ☐ 1040 ☐ 1050 ☐ 1052 ☐ 1053 ☐ 1055 ☐ 1060 ☐ 1065 ☐ 1070 ☐ 1075 ☐ 1080
☐ 11a Equipment	☐ 1100 ☐ 1161
☐ 12a Furnishings	☐ 1201 ☐ 1230 ☐ 1250 ☐ 1260 ☐ 1270
☐ 13a Special Facilities	☐ 1300 ☐ 1304 ☐ 1305 ☐ 1306 ☐ 1307 ☐ 1318 ☐ 1319 ☐ 1320 ☐ 1321 ☐ 1322 ☐ 1323 ☐ 1324 ☐ 1325 ☐ 1326 ☐ 1328
☐ 14a Conveying Systems	☐ 1401 ☐ 1420 ☐ 1440 ☐ 1460
☐ 15a Mechanical	☐ 1525 ☐ 1530 ☐ 1540 ☐ 1550 ☐ 1555 ☐ 1565 ☐ 1574 ☐ 1589 ☐ 1595
☐ 16 Electrical	☐ 1600 ☐ 1605 ☐ 1620 ☐ 1630 ☐ 1639 ☐ 1640 ☐ 1650 ☐ 1655 ☐ 1660 ☐ 1670 ☐ 1671 ☐ 1685 ☐ 1694
4. ☒ NOT APPLICABLE	No portion of DOE Order 6430.1A is applicable to this Design. <i>Mark E. Zimera</i>
5. ☐ AS-BUILT	ECO is for as-built field verified changes only.

NOTE: A check placed in the Division column signifies that the entire Division shall be applicable to the Design, unless modified by checks indicated for specific Subdivisions.

COMMENTS: _____

9a
DRAWING CHANGE SHEET
(1 SHEET PER DRAWING)

m.h. 5/14/92 m.h. 9/14/92
5 12
Page 4 of 6

1. Drawing: 412-N-002-W (Rev. F) ECO Number: 6388

2. ECO Search List: 6246

3. Description of Change:

- i) ITEM # 38: Change part no. HMW-014KN2 to
HMW-KN2XXX
- ii) Detail no. 4: Change THERMOCOUPLE (TYPICAL) to
THERMOCOUPLE 5X
- iii) Note 17: Change 17 to 17
- iv) Note no. 2: Delete the sentence, "DISCARD THE NUPRO
FILTER ELEMENT IN THE HOUSING."
- v) Detail no. 2: Change 4X to 8X
- vi) Add note no. 24: AFTER PERFORMING THE HELIUM LEAK
TEST AND CLOSING THE VALVES THE
HANDLES ON THE 1/2" VALVES ARE TO BE
REMOVED PRIOR TO SHIPPING.
- vii) Value notes: Add heading NOTES CONTINUED to value
notes. Change value notes nos. 1 through
7 to 20 through 27, as marked on the
drawing.

4. Drawing Cog. Engineer Approval: Maria E. Humer Date: 9/8/92

9a
DRAWING CHANGE SHEET
(1 SHEET PER DRAWING)

9/14/92

W.W.
9/14/92

12
T&H

Page 5 of 5

1. Drawing: 412-F-017-W1 (Rev. F) ECO Number: 6388

2. ECO Search List: 6246

3. Description of Change:

- i) Bin Elevation Title: Change bin elevation title
ELEVATION SIM. OPPOSITE SIDE
to ELEVATION SIM. OPPOSITE SIDE
EXCEPT WELD AT SECTION B-B
- ii) ITEM no. 26: Change material specification COPPER to
copper ASTM B 187 H04

4. Drawing Cog. Engineer Approval: Mark E. Hines Date: 9/8/92

9a

9/14/92

12

9 of 11

DRAWING CHANGE SHEET

(1 SHEET PER DRAWING)

Page 6 of 6

1. Drawing: 412-N-003-W1 (Rev. D) ECO Number: 63882. ECO Search List: NONE

3. Description of Change:

i) ITEM no. 18: Add Standard plate thickness 0.25 inch
to plate hook4. Drawing Cog. Engineer Approval: Mark E. Himes Date: 9/8/92

DESIGN DOCUMENT CHANGE SHEET

D-R A E

EPC# 6382
Page 11 of 121. Title and Document Number: MECHANICAL SAFETY RELIEF SYSTEM FOR TEST BANK
D-00842. Changes: Change statement for minimum burst pressure
of the rupture disc for attached sheet, page 12.

3. Markups attached (Note: Pages must be revised to reflect actual change as implemented)

4. Description of change:

See attached sheet, page 12.

5. Document Cog. Engineer Approval:

Mark C. Hines

Date:

9/14/92

6. Posted by:

Signature

Date

DRAFT

9/14/92

~~Page 12 of 12~~
Page 12 of 12
ECO 6388

section. The following documents shall be considered a part of this specification. Unless otherwise stated, the latest version shall apply.

2.1 Test Plan: WIPP Bin-Scale CH TRU Waste Tests, M. A. Molecke, Sandia National Laboratories, Albuquerque, New Mexico, January 1990

2.2 Test Plan Addendum #1: Waste Isolation Pilot Plant Bin-Scale CH TRU Waste Tests, M.A. Molecke, A.R. Lappin, Sandia National Laboratories, Albuquerque, New Mexico, December 1990.

2.3 Parametric Evaluation of Pressure Relief System for Bin-Scale CH TRU Waste Tests, Design Review No. 91-04.

3.0 DESIGN REQUIREMENTS

This section describes the requirements for design, maintenance, personnel, materials, fabrication, packaging, and shipping.

3.1 General Requirements

The design of the mechanical relief system shall: 1) be based on existing technology, maximizing the use of standard available components, and standard design and construction for the service specified; 2) be designed, assembled and tested in conformance with this specification; 3) comply with recognized industrial standards and practices (if applicable); and 4) be of sound quality.

Source inspection and acceptance testing of the rupture discs shall be performed at the vendor's facility prior to shipment.

All materials of construction will be suitable for use in the WIPP salt mine and capable of performing their intended functions over the duration of the bin experiments.

3.2 Design

Least, The maximum burst pressure of the rupture disc shall not exceed 90 percent of the system's limiting design pressure. The bin is the limiting component in the system with a design pressure of 6.1 psig. The minimum burst pressure of the rupture disc shall be ~~at least~~ 150% higher than the maximum pressure combination of the bin and the environmental conditions as discussed in reference Section 2.3. Upon relief, the maximum flow capacity of the rupture disc relief path shall be compatible with the flow capacity of the VMS manifold (Refer to Design Specification D-0077). All components shall be rigidly supported so that the seal integrity of the system is not compromised. All rupture discs shall be certified by the manufacturer. Certification shall include: 1) nominal burst pressure and tolerance, 2) helium leak tightness to 1×10^{-6} scc/sec Helium, 3) non-fragmenting type, and 4) able to withstand a backpressure of 5 psig (+0.5 psig - 0.0 psig). The words "BIN SIDE" shall be engraved on the inlet side of the disc and "VOC HEADER" engraved on the outlet side of the disc.

3.3 Materials

The mechanical safety relief assembly shall be made from nickel and stainless steel materials. Both of these materials are acceptable for the five year

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DRAFT

ECO 6401

ENGINEERING CHANGE ORDER **DRAFT**

USE BLACK INK

Page 1 of 6

<p>1. ECO No.: <u>6401</u></p> <p>6W CC&D Review: <u>Q/L 11-24-92</u></p>	<p>2. Impact Level 1 ☐ 2 ☐ 3 ☒ 4 ☐</p> <p>3. System: <u>WHO's</u> Equipment No.: <u>63-5-001</u> Building: <u>U/G</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>4. Associated Documents:</p> <p>PWR <u>N/A</u></p> <p>ECP <u>N/A</u></p> <p>P.O. <u>N/A</u></p> <p>Others <u>N/A</u></p> </td> <td style="width: 50%; vertical-align: top;"> <p>5. Document Type:</p> <p>Drawing <u>412-M-007-W1</u> ☒</p> <p>Specification ☐</p> <p>Vendor Data ☐</p> <p>SDD ☐</p> <p>Others _____</p> </td> </tr> </table> <p>6. Title of Change: <u>Dimensional Change to Manifold</u></p>	<p>4. Associated Documents:</p> <p>PWR <u>N/A</u></p> <p>ECP <u>N/A</u></p> <p>P.O. <u>N/A</u></p> <p>Others <u>N/A</u></p>	<p>5. Document Type:</p> <p>Drawing <u>412-M-007-W1</u> ☒</p> <p>Specification ☐</p> <p>Vendor Data ☐</p> <p>SDD ☐</p> <p>Others _____</p>
<p>4. Associated Documents:</p> <p>PWR <u>N/A</u></p> <p>ECP <u>N/A</u></p> <p>P.O. <u>N/A</u></p> <p>Others <u>N/A</u></p>	<p>5. Document Type:</p> <p>Drawing <u>412-M-007-W1</u> ☒</p> <p>Specification ☐</p> <p>Vendor Data ☐</p> <p>SDD ☐</p> <p>Others _____</p>		
<p>7. Originator: (print) <u>M. E. Herrera</u></p>	<p>Ext. No.: <u>9391</u> Department: <u>BSTP</u> Date: <u>9/24/92</u></p>	<p>8. Cognizant Engineer: (print) <u>M. E. Herrera</u></p>	
<p>9. Description of Change:</p> <div style="text-align: right; margin-right: 100px;"> Yes ☐ No ☒ Component indices change required (if yes, attach sheets) </div> <p style="font-size: 1.2em; margin-top: 20px;"><u>Change the Dimensions on DWG. 412-M-007-W.</u></p> <div style="margin-top: 100px;"> <div style="display: flex; justify-content: space-between;"> <div> ☒ 9a Drawing Change Sheet attached ☐ 9b Design Documentation Sheet attached </div> <div> ☐ 9c Vendor Data Change Sheet attached </div> </div> </div>			
<p>10. Yes ☐ No ☒ MODIFICATION IN PROGRESS</p> <p> ☐ Modification complete: _____</p> <div style="text-align: center; margin-top: -10px;"> Signature Date </div> <div style="margin-top: 10px;"> ☐ Change drawing per addendum dated: _____ ☐ Change drawing per ECO-provided data ☐ Temporary modification </div> <div style="float: right; margin-top: 20px; border-left: 1px solid black; padding-left: 10px;"> ECO will be incorporated after M.I.P. signed complete </div>			
<p>11. Design Verification Requirements: (per WP 09-018) EDT No.: _____</p> <p><u>H. E. Herrera</u> <u>9/28/92</u></p> <ol style="list-style-type: none"> _____ 1. Requirements satisfied by review/approval of design document _____ 2. Independent review _____ 3. Alternate calculations _____ 4. Development testing _____ 5. Design review _____ 6. Other: _____ 			
<p>12. Addendum Sheet added: _____</p> <div style="text-align: center; margin-top: -10px;"> Signature Date </div>			

13. Justification

Dimensional Changes are required to represent the As-Built Configuration.

14. Administrative Tracking

YES N/A

- ☐ ☒ 1. FSAR
☐ ☒ 2. Calibration Procedures
☐ ☒ 3. Maintenance Procedures
☐ ☒ 4. Computer Software
☐ ☒ 5. Operations Procedures

YES N/A

- ☐ ☒ 6. Startup/Acceptance Test
☐ ☒ 7. Test Requirement & Spec.
☐ ☒ 8. SDD
☐ ☐ 9. _____
☐ ☐ 10. _____

15. Signature Requirements

Impact
Level

	☐ A	Cog. Engineer	<u>M. E. Herrera</u>
4	☐ A	Cog. Manager	<u>W. Bell</u>
	☐ R	Startup	<u>W. Bell</u>
3	☐ A	QA	<u>W. Bell</u>
	☐	Cog. Ops. Mgr.	
	☐	DOE	
2	☐	Safety	
	☐	Maintenance	
	☐	Dept. Manager	
	☐	Asst. Gen. Mgr.	
	☐	Operations	
	☐	SNL	
	☐		
	☐		
	☐		

KEY
 A=APPR.
 R=REVIEW
 S=SIGN NEW
 DRAWING

16. Distribute as Marked

☒	Maintenance (MANDATORY)	<u>WENDELL JOHNS</u>
☐	Ops. Support	
☐	Startup	
☐	Facility Operations	
☐	U/G Operations	
☐	Orig./Design Engr.	
☒	Cog. Engineer	<u>M. E. Herrera</u>
☐	Others	
☐		
☐		
☐		
☐		
☐		
☐		
☐		

ENGINEERING CHANGE ORDER

DOE ORDER 6430.1A DESIGN CRITERIA CHECKLIST

PAGE 3 OF 6
 1. ECO # 6401
 2. DATE: 7/24/92

DRAFT

The design requirements in DOE Order 6430.1A checked below
have been applied to this Design.

3. DIVISION	SUBDIVISION
☐ 1 General Requirements	☐ 0101 ☐ 0106 ☐ 0109 ☐ 0110 ☐ 0111 ☐ 0140 ☐ 0150 ☐ 0170
☐ 2 Site and Civil Engineering	☐ 0200 ☐ 0201 ☐ 0202 ☐ 0203 ☐ 0205 ☐ 0210 ☐ 0214 ☐ 0215 ☐ 0220 ☐ 0235 ☐ 0245 ☐ 0250 ☐ 0256 ☐ 0250 ☐ 0262 ☐ 0266 ☐ 0267 ☐ 0270 ☐ 0273 ☐ 0275 ☐ 0276 ☐ 0278 ☐ 0279 ☐ 0280 ☐ 0281 ☐ 0283 ☐ 0285 ☐ 0290 ☐ 0291
☐ 3 Concrete	☐ 0300 ☐ 0301 ☐ 0310 ☐ 0320 ☐ 0330 ☐ 0340 ☐ 0350 ☐ 0370 ☐ 0380
☐ 4 Masonry	☐ 0400 ☐ 0401 ☐ 0410 ☐ 0420 ☐ 0455
☐ 5 Metals	☐ 0500 ☐ 0512 ☐ 0514 ☐ 0521 ☐ 0531 ☐ 0532
☐ 6 Wood and Plastics	☐ 0600 ☐ 0610 ☐ 0650
☐ 7 Thermal and Moisture Protection	☐ 0710 ☐ 0711 ☐ 0714 ☐ 0715 ☐ 0719 ☐ 0720 ☐ 0721 ☐ 0722 ☐ 0724 ☐ 0727 ☐ 0730 ☐ 0750 ☐ 0751 ☐ 0753 ☐ 0760 ☐ 0790
☐ 8 Doors and Windows	☐ 0800 ☐ 0810 ☐ 0820 ☐ 0830 ☐ 0833 ☐ 0836 ☐ 0839 ☐ 0850 ☐ 0860 ☐ 0870 ☐ 0880
☐ 9 Finishes	☐ 0900 ☐ 0910 ☐ 0920 ☐ 0925 ☐ 0930 ☐ 0950 ☐ 0965 ☐ 0968 ☐ 0970 ☐ 0980 ☐ 0990 ☐ 0995
☐ 10 Specialties	☐ 1015 ☐ 1020 ☐ 1024 ☐ 1027 ☐ 1030 ☐ 1040 ☐ 1050 ☐ 1052 ☐ 1053 ☐ 1055 ☐ 1060 ☐ 1065 ☐ 1070 ☐ 1075 ☐ 1080
☐ 11 Equipment	☐ 1100 ☐ 1161
☐ 12 Furnishings	☐ 1201 ☐ 1230 ☐ 1250 ☐ 1260 ☐ 1270
☐ 13 Special Facilities	☐ 1300 ☐ 1304 ☐ 1305 ☐ 1306 ☐ 1307 ☐ 1318 ☐ 1319 ☐ 1320 ☐ 1321 ☐ 1322 ☐ 1323 ☐ 1324 ☐ 1325 ☐ 1326 ☐ 1328
☐ 14 Conveying Systems	☐ 1401 ☐ 1420 ☐ 1440 ☐ 1460
☐ 15 Mechanical	☐ 1525 ☐ 1530 ☐ 1540 ☐ 1550 ☐ 1555 ☐ 1565 ☐ 1574 ☐ 1589 ☐ 1595
☐ 16 Electrical	☐ 1600 ☐ 1605 ☐ 1620 ☐ 1630 ☐ 1639 ☐ 1640 ☐ 1650 ☐ 1655 ☐ 1660 ☐ 1670 ☐ 1671 ☐ 1685 ☐ 1694
4. ☒ NOT APPLICABLE	No portion of DOE Order 6430.1A is applicable to this Design.
5. ☒ AS-BUILT	ECO is for as-built field verified changes only.

NOTE: A check placed in the Division column signifies that the entire Division shall be applicable to the Design, unless modified by checks indicated for specific Subdivisions.

COMMENTS: _____

9a

DRAWING CHANGE SHEET

(1 SHEET PER DRAWING)

DRAFT

Page 4 of 6

1. Drawing: 412-M-007-W1ECO Number: 64012. ECO Search List: NONE

3. Description of Change:

Per the attached Mark ups. (see pages 5 and 6
of this ECO) 9/24/92

4. Drawing Cog. Engineer Approval: Mark E. AmaraDate: 9/24/92

DRAFT

Change dimension
to 38.98"

② OXYGEN GETTER/RECIRCULATION IN BACKUP AND
RECIRCULATION OUT MANIFOLD ASSEMBLY GROUP 2

From: DWG. 412-M-007-W2
Rev. A

DRAFT

Page 6 of 6

ELC No: 6401

SUPPLIERS:
A. SWAGELOK CO

11 OXYGEN GETTER/ARGON PURGE OUT MANIFOLD ASSY. GROUP 3

DRAFT

ECO 6494

ENGINEERING CHANGE ORDER

DRAFT

Page 1 of 2

6

C USE BLACK INK

1. ECO No.: <u>6494</u>		2. Impact Level 1 ☐ 2 ☐ 3 ☐ 4 ☒	
3. CC&D Review: <u>11/17/92</u>		3. System: <u>WHO 6</u> Equipment No.: <u>63-S-001</u> Building: <u>UG</u>	
4. Associated Documents: PWR <u>N/A</u> ECP <u>N/A</u> P.O. <u>N/A</u> Others <u>N/A</u>		5. Document Type: Drawing 412-F-017-W1 ☒ Specification Rev. F ☐ Vendor Data ☐ SDD ☐ Others ☐	
6. Title of Change: <u>Update Dwg. 412-F-017-W1</u>			
7. Originator: (print) <u>D. G. Allen</u>		8. Cognizant Engineer: (print) <u>M.E. Herrera</u>	
Ext. No.: <u>3283</u> Department: <u>BSTP</u> Date: <u>10/19/92</u>			
9. Description of Change: <div style="text-align: right;">Yes ☐ No ☒ Component indices change required (if yes, attach sheets)</div> <p>Changes listed on Page 2, (9a) required to show the unit "As Built" and provide clearer information for construction of any additional units.</p>			
☒ 9a Drawing Change Sheet attached ☐ 9b Design Documentation Sheet attached		☐ 9c Vendor Data Change Sheet attached	
10. Yes ☐ No ☒ MODIFICATION IN PROGRESS Modification complete: _____ Signature _____ Date _____ ECO will be incorporated after M.I.P. signed complete			
☐ Change drawing per addendum dated: _____ ☐ Change drawing per ECO-provided data ☐ Temporary modification			
11. Design Verification Requirements: (per WP 09-018)		EDT No.: _____	
<u>11/16/92</u> <u>J.W. Bell</u>		1. Requirements satisfied by review/approval of design document	
_____		2. Independent review	
_____		3. Alternate calculations	
_____		4. Development testing	
_____		5. Design review	
_____		6. Other: _____	
12. Addendum Sheet added: <u>Amelia D. Najera</u>		<u>12/29/92</u>	
Signature		Date	

M.H. 11/11/92

6

Page 2 of 3

IN ECO No.: 6494

13. Justification

DRAFT

The changes listed are required to fully show the "As Built" configuration and to provide clear and complete information for construction of any additional units that may be required.

14. Administrative Tracking

YES N/A

- ☐ ☒ 1. FSAR
- ☐ ☒ 2. Calibration Procedures
- ☐ ☒ 3. Maintenance Procedures
- ☐ ☒ 4. Computer Software
- ☐ ☒ 5. Operations Procedures

YES N/A

- ☐ ☒ 6. Startup/Acceptance Test
- ☐ ☒ 7. Test Requirement & Spec.
- ☐ ☒ 8. SDD
- ☐ ☒ 9. _____
- ☐ ☒ 10. _____

15. Signature Requirements

KEY
A=APPR
R=REVIEW
S=SIGN NEW
DRAWING

Initials
Level

4	☒ A	Cog. Engineer	<i>Mal e Hume</i> 11/11/92
4	☒ A	Cog. Manager	<i>John Bell</i> 11/11/92
	☒ R	Startup	<i>For [unclear]</i> 11/17/92
3	☐	QA	_____
	☐	Cog. Ops. Mgr.	_____
	☐	DOE	_____
2	☐	Safety	_____
	☐	Maintenance	_____
	☐	Dept. Manager	_____
1	☐	Asst. Gen. Mgr.	_____
	☐	Operations	_____
	☐	SNL	_____
	☐	_____	_____
	☐	_____	_____
	☐	_____	_____

16. Distribute as Marked

☒	Maintenance	<i>HARRY ALLEN</i> 11/14/92
☐	Ops. Support	_____
☐	Startup	_____
☐	Facility Operations	_____
☐	U/G Operations	_____
☐	Orig./Design Engr.	_____
☒	Cog. Engineer	_____
☐	Others	_____
☐	_____	_____
☐	_____	_____
☐	_____	_____
☐	_____	_____
☐	_____	_____
☐	_____	_____

ENGINEERING CHANGE ORDER

DOE ORDER 6430.1A DESIGN CRITERIA
CHECKLIST

DRAFT

PAGE 3 OF 6
1. ECO # 10494
2. DATE: 10/19/92

The design requirements in DOE Order 6430.1A checked below
have been applied to this Design.

3.	DIVISION	SUBDIVISION
☐ 1	General Requirements	☐ 0101 ☐ 0106 ☐ 0109 ☐ 0110 ☐ 0111 ☐ 0140 ☐ 0150 ☐ 0170
☐ 2	Site and Civil Engineering	☐ 0200 ☐ 0201 ☐ 0202 ☐ 0203 ☐ 0205 ☐ 0210 ☐ 0214 ☐ 0215 ☐ 0220 ☐ 0235 ☐ 0245 ☐ 0250 ☐ 0256 ☐ 0260 ☐ 0262 ☐ 0266 ☐ 0267 ☐ 0270 ☐ 0273 ☐ 0275 ☐ 0276 ☐ 0278 ☐ 0279 ☐ 0280 ☐ 0281 ☐ 0283 ☐ 0285 ☐ 0290 ☐ 0291
☐ 3	Concrete	☐ 0300 ☐ 0301 ☐ 0310 ☐ 0320 ☐ 0330 ☐ 0340 ☐ 0350 ☐ 0370 ☐ 0380
☐ 4	Masonry	☐ 0400 ☐ 0401 ☐ 0410 ☐ 0420 ☐ 0455
☐ 5	Metals	☐ 0500 ☐ 0512 ☐ 0514 ☐ 0521 ☐ 0531 ☐ 0532
☐ 6	Wood and Plastics	☐ 0600 ☐ 0610 ☐ 0650
☐ 7	Thermal and Moisture Protection	☐ 0710 ☐ 0711 ☐ 0714 ☐ 0715 ☐ 0719 ☐ 0720 ☐ 0721 ☐ 0722 ☐ 0724 ☐ 0727 ☐ 0730 ☐ 0750 ☐ 0751 ☐ 0753 ☐ 0760 ☐ 0790
☐ 8	Doors and Windows	☐ 0800 ☐ 0810 ☐ 0820 ☐ 0830 ☐ 0833 ☐ 0836 ☐ 0839 ☐ 0850 ☐ 0860 ☐ 0870 ☐ 0880
☐ 9	Finishes	☐ 0900 ☐ 0910 ☐ 0920 ☐ 0925 ☐ 0930 ☐ 0950 ☐ 0965 ☐ 0968 ☐ 0970 ☐ 0980 ☐ 0990 ☐ 0995
☐ 10	Specialties	☐ 1015 ☐ 1020 ☐ 1024 ☐ 1027 ☐ 1030 ☐ 1040 ☐ 1050 ☐ 1052 ☐ 1053 ☐ 1055 ☐ 1060 ☐ 1065 ☐ 1070 ☐ 1075 ☐ 1080
☐ 11	Equipment	☐ 1100 ☐ 1161
☐ 12	Furnishings	☐ 1201 ☐ 1230 ☐ 1250 ☐ 1260 ☐ 1270
☐ 13	Special Facilities	☐ 1300 ☐ 1304 ☐ 1305 ☐ 1306 ☐ 1307 ☐ 1318 ☐ 1319 ☐ 1320 ☐ 1321 ☐ 1322 ☐ 1323 ☐ 1324 ☐ 1325 ☐ 1326 ☐ 1328
☐ 14	Conveying Systems	☐ 1401 ☐ 1420 ☐ 1440 ☐ 1460
☐ 15	Mechanical	☐ 1525 ☐ 1530 ☐ 1540 ☐ 1550 ☐ 1555 ☐ 1565 ☐ 1574 ☐ 1589 ☐ 1595
☐ 16	Electrical	☐ 1600 ☐ 1605 ☐ 1620 ☐ 1630 ☐ 1639 ☐ 1640 ☐ 1650 ☐ 1655 ☐ 1660 ☐ 1670 ☐ 1671 ☐ 1685 ☐ 1694
4. ☒	NOT APPLICABLE	No portion of DOE Order 6430.1A is applicable to this Design.
5. ☒	AS-BUILT	ECO is for as-built field verified changes only.

NOTE: A check placed in the Division column signifies that the entire Division shall be applicable to the Design, unless modified by checks indicated for specific Subdivisions.

COMMENTS:

DRAWING CHANGE SHEET

(1 SHEET PER DRAWING)

DRAFT

1. Drawing: 412-F-017-W, Rev. F ECO Number: 6494

2. ECO Search List: 6246(M) 6388(O)

3. Description of Change:

A. Section C-C (page 1, B5)

Add 1.75 dimension from the inside vertical edge of the bin to the left end of Item 21.

Add a 45 dimension to the upper surface of Item 21.

B. 1" Valve Mount Assembly - GR4 (page 1, C5)

Move the phantom lines representing Item 3 down one material thickness (the present lower line will be the new upper line). (Only the 1 5/16" SAE thread passes thru the material of Item 3.)

Add a balloon identifying Item 18.

Show the balloon and numeral for Item 7 in the same size and line weight as the name (1" valve . . .).

C. 1/2" Valve Mount Assembly - GR3 (page 1, C3)

Move the phantom lines representing Item 3 down one material thickness (the present lower line will be the new upper line). (Only the 3/4" SAE thread passes thru the material of Item 3.)

Show the balloon and numeral for Item 6 in the same size and line weight as the name (1/2" valve . . .).

Show Item 22 with handle removed (consistent with Item 25).

D. Balloon for Item 18 DETAIL 3 (page 1, F5)

Add specification for a 1.43 diameter hole thru Item 3, four times.

E. Balloon for Item 9 DETAIL 4 (page 1, F3)

Add specification for an 0.88 diameter hole thru Item 3, four times.

F. Item 1, DRY BIN BODY ASSEMBLY GR1 (page 1, F6)

Shown the balloon and numeral for Item 1 in the same size and line weight as the name (DRY BIN . . .).

G. Item 11, DRY TEST BIN LID GR2 (page 1, F6)

Show the balloon and numeral for Item 1 in the same size and line weight as the same (DRY TEST . . .).

4. Drawing Cog. Engineer Approval: Mark E. Hmura

Date: 11/11/92

9a
DRAWING CHANGE SHEET **DRAFT**
(1 SHEET PER DRAWING)

Page 5 of 6

1. Drawing: 412-E-017-W, Rev. E ECO Number: 6494

2. ECO Search List:	<u>6246(M)</u>	<u> </u>	<u> </u>	<u> </u>
	<u>6388(O)</u>	<u> </u>	<u> </u>	<u> </u>
	<u> </u>	<u> </u>	<u> </u>	<u> </u>
	<u> </u>	<u> </u>	<u> </u>	<u> </u>

3. Description of Change:

H. Note 11

Correct spelling - "PERFERRED" should be "PREFERRED".

J. R.H. View, Dry Bin Body Assembly GR1 (page 1, F4)

Duplicate the Stencil "box" associated with Note 9 (located in G3) at a position 6.25" from the right hand edge of the bin and 3.00" from the bottom of Item 4 to the top of the "box". Include reference mark for Note 9. (Note 9 implies two stencil locations.)

K. Detail view of Item 12 (page 1, G7)

Remove leader on balloon for Item 12, and reposition it under the view with its name. Show balloon, Item number, and description in the same size and weight of type as Item 6 and Item 7 (Refer to B. and C. on page 7 of this ECO).

L. Bill of Material (page 1, F2)

Add Item 35, #8-32 x .44 long S.H.C.S. with a quantity of two (2) per each GR5 subassembly.

4. Drawing Cog. Engineer Approval: *Mark E. Hume*

Date: 11/11/92

ENGINEERING CHANGE ORDER
ADDENDUM SHEET

DRAFT

Page 1 of 1

1. Addendum A to ECO Number: 6494 Drawing Number: 412-F-017-W1

2. Description of change:

1. On Item D of Page 4, change the dia. from 1.43 inches to 3.0 inches.
2. On Item E of Page 4, Change the dia. from .88 inches to 1.75 inches.
3. On Item C of Page 4, Delete the change described as follows, "Move the Phantom line representing Item 3". The remainder shall be applicable.

3. Approvals

Cognizant Engineer:

Mark E. Himes
Signature

12/22/92
Date

CC&D Mgr. /Desig. Rep.:

A. Hunt
Signature

12/29/92
Date

Other Approval:

Angela W. Najera
Signature

12/29/92
Date

Other Approval:

Signature

Date

DRAFT

ATTACHMENT III-3
SWB/RCB DESIGN DRAWINGS

DRAFT

ATTACHMENT III-4

WASTE HANDLING BUILDING
SECONDARY CONTAINMENT SYSTEM DRAWINGS

DRAFT

ATTACHMENT III-5

**TEST BIN FLAMMABLE GAS
CONCENTRATION CONTROL**

26

27 One of the safety requirements for the Type 1 bins is that the mixtures of flammable gases within
 28 the bin headspace must be purged if they reach a level that is one-half of their lower flammability
 29 limit (LFL) in air. For the gases anticipated (e.g., hydrogen and methane), the LFL is synonymous
 30 ✓ with the lower explosive limit. Surveillance, purging, and all other operational aspects are
 31 ✓ performed by trained facility personnel, in accordance with written procedures. Since the
 32 ✓ surveillance and purging have the potential of affecting the experimental data, all activities are
 33 ✓ performed after consultation with the Principal Investigator (PI) who is a representative of the
 34 ✓ Scientific Advisory Board for the WIPP Project, Sandia National Laboratories. Sampling occurs
 35 ✓ at a frequency established by the PI. Sampling frequency will be increased if gas generation
 36 rates indicate an increase is necessary to determine when the purge limit is being approached.

37

38 ✓ Samples consist of specimens that may range from 10 to 250 cubic centimeters each and are
 39 analyzed at the WIPP Analytical Laboratory. If the samples reveal flammable levels in excess
 40 of the purge limit, the PI is notified. Depending on the type of experiment, the PI will determine
 41 as soon as possible, the type of purge gas to use (either argon or nitrogen), the length of time
 42 the purge is to proceed, and the number of subsequent samples required. Purged gases are
 43 exhausted into the VOC manifold at a rate up to the maximum flow rate for the manifold. The
 purge time is set to assure that there has been at least one exchange of the bin atmosphere.
 At the end of the purge, a sample is taken and analyzed if determined to be appropriate by the
 PI. All safety-related purging activities are documented on a written form and stored in the facility
 operating record.

DRAFT

DRAFT

ATTACHMENT IV-1
CARBON SORPTION BED DESIGN CALCULATIONS

DRAFT

APPENDIX D11
TYPICAL CARBON SORPTION BED EFFICIENCY

DRAFT

APPENDIX D11 TYPICAL CARBON SORPTION BED EFFICIENCY

Purpose

To determine design concentrations for VOCs and establish the amount of carbon necessary for VOC adsorption as well as bed exchange frequency.

Modeling Requirements

This model is designed to theoretically allow no migration of five targeted VOCs past the carbon bed adsorption system. The target VOCs are:

- Trichloroethane
- Trichloroethylene
- Carbon tetrachloride
- Freon 113
- Methylene chloride

All calculations done @ STP

Methodology

The methodology used is as follows:

- Establish target VOC percent contribution to headspace gas by waste type (Table D11-1)
- Calculate average target VOC composition in headspace gas (Table D11-2)
- Calculate partial pressure of each of the five target VOCs
- Calculate carbon efficiencies from Calgon-BPL isotherms (Figures D11-1 through D11-5)
- Determine total VOC loading (Table D11-3)
- Calculate carbon required (Table D11-3).

Assumptions

- Manifold system is pressure balanced and the average pressure is 14.7 psia.

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- Total gas release rate is 5 moles/drum/year.
- Six drums will be placed in each bin.
- There are 116 bins with waste per room
- All gases are ideal (22.4 L/mole @ STP).
- System volume and temperature remain constant, therefore compound partial pressure is a function of percent total compound contribution to overall ambient pressure (atmospheric) of 14.7 psia.

VOC Partial Pressure Calculation = $\frac{\text{Fraction of Total Contribution of a Given VOC Compound} \times \text{STP at Average Atmospheric Pressure}}{\text{STP at Average Atmospheric Pressure}}$

$$\text{Compound Partial Pressure} = \frac{\% \text{ of Total Contribution of a given VOC compound (Table D11-2)}}{100} (14.7 \text{ psia})$$

$$1,1,1, \text{Trichloroethane} = \frac{.2103}{100} (14.7) = 0.031 \text{ psi}$$

$$\text{Trichloroethylene} = \frac{.0069}{100} (14.7) = 0.0010 \text{ psi}$$

$$\text{Carbon Tetrachloride} = \frac{.0182}{100} (14.7) = 0.0027 \text{ psi}$$

$$\text{Methylene Chloride} = \frac{.0158}{100} (14.7) = 0.0023 \text{ psi}$$

$$\text{Freon 113} = \frac{.0443}{100} (14.7) = 0.0065 \text{ psi}$$

The calculated partial pressures for each compound were plotted on sorption isotherms that were specific to each VOC. The isotherms are plots of VOC partial pressure versus the specific sorption capacity, by weight, of the activated carbon for the particular OC at various equilibrium temperatures. The sorption capacity is represented as an efficiency of grams of sorbed VOC per gram of activated carbon. The sorption efficiency values are shown below (see attached isotherms in Figures D11-1 through D11-5).

- 1,1,1, Trichloroethane 64%
- Trichloroethylene 33%
- Methylene Chloride 77%
- Freon 113 52%
- Carbon Tetrachloride 40%

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The capacity factor is calculated to determine the number of grams of carbon required to sorb 1 gram of a particular VOC. The formula for calculation of the capacity factor is shown on Table D11-3, along with capacity factor values. The total carbon requirements for sorbing 100 percent of all five target VOCs per bin per year is also shown in Table D11-2. The total carbon requirements value of 23.70 grams of carbon/bin/year is the sum of the individual carbon requirement for each of the five target compounds.

The calculated carbon requirements for sorbing all VOCs for all of the bins in each room is:

$$\begin{aligned} (Total\ Carbon/bin/year) (116\ bins) &= Total\ carbon/room/year \\ (21.36g/bin/year) (116\ bins) &= 2,478\ grams/room/year \end{aligned}$$

As has been previously stated in the VOC Monitoring Plan, Calgon recommends a 100 percent overdesign criteria, therefore:

$$(2,478) + 2,478 = 4,956\ grams/carbon/room/year$$

WIPP Project personnel are designing for an additional 140 percent overdesign specification which yields a carbon bed capacity of approximately 12 Kg/room/year. This value (12 Kg/room/year) represents a 4.80 overdesign factor based on the calculated total requirement. The system design will be more than 95 percent efficient.

TABLE 1
HEADSPACE COMPOSITION CALCULATION

WASTE TYPE	WASTE TYPE % OF TOTAL	PERCENT OF COMPOUND IN WASTE TYPES									
		NO.	TRICHL	I-PROP	TRCETHY	CCL4	DCM	DCETHA	1.2 FREON	CYCHEX	DCETHY
(1)	12%	I-MAX	0.94	0	0.04	0.04	0.22	0	0	0	0
		I-MIN	0	0	0	0	0	0	0	0	0
		I-AVG	0.1978	0	0.005	0.0025	0.0203	0	0	0	0
		I-COUNT	32	32	32	32	32	32	32	32	32
(2)	37%	II-MAX	2.84	0	0.17	0.09	0.42	0.4	0.81	0.17	0.03
		II-MIN	0	0	0	0	0	0	0	0	0
		II-AVG	0.2669	0	0.0043	0.0028	0.0203	0.0106	0.0103	0.0021	0.0003
		II-COUNT	78	78	78	78	78	78	78	78	78
(3)	49%	III-MAX	1.08	0.62	0.14	0.29	0.25	0	2.87	0	0
		III-MIN	0	0	0	0	0	0	0	0	0
		III-AVG	0.1238	0.0201	0.0087	0.0088	0.0089	0	0.0389	0	0
		III-COUNT	77	77	77	77	77	77	77	77	77
(4)	2%	IV-MAX	7.48	0	0.14	4.09	0.71	0	10.4	0	0
		IV-MIN	0	0	0	0	0	0	0	0	0
		IV-AVG	1.3582	0	0.0213	0.6734	0.0726	0	1.0717	0	0
		IV-COUNT	23	23	23	23	23	23	23	23	23

% TOTAL CONTRIBUTION
 FOR EACH VOC SPECIES = $\sum_{i=1}^4$ (WASTE TYPE %
 OF TOTAL WASTE) x (PERCENT OF COMPOUND
 IN WASTE TYPE)

(EXAMPLE) % TOTAL CONTRIBUTION
 FOR 1,1,1,TRICHLOROETHANE = $(.12)(.1978) + (.37)(.2669) + (.49)(.1238) + (.02)(1.3582)$
 = 0.2103%

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TABLE 2
CARBON SORPTION BED SPECIFICATIONS

	% TOTAL CONTRIBUTION	CALCULATED PARTIAL PRESSURES OF THE TARGET ^{1a} VOCs	MOLE/BIN/YR ^{1a}	MW (g/mole)	g/BIN/YEAR ^{1a}	CAPACITY FACTOR g CARBON/g VOC ^{1a}	g CARBON/BIN/YEAR ^{1a}
1,1,1-Trichloroethane	0.2103	0.0310	0.0821	133	8.39	1.56	13.08
Trichloroethylene	0.0069	0.0010	0.0021	131	0.27	3.03	0.82
Carbon Tetrachloride	0.0182	0.0027	0.0055	154	0.85	2.5	2.12
Methylene Chloride	0.0168	0.0025	0.0050	85	0.42	1.30	0.55
Freon 113	0.0443	0.0065	0.0133	187	2.49	1.92	4.78
					12.42 grams/BIN/YR TOTAL VOCs		21.36 grams TOTAL/REQUIRED/BIN/YEAR

(a)	Percent Total Contribution 100	(14.7 psi)	-	Compound Partial Pressure
(b)	Mole/Bin/Yr	-	(% Total Contribution) 100	(30 Mole/Bin/Yr)
(c)	g/Bin/Yr	-	(Mole/Bin/Yr) (g/Mole)	
(d)	Capacity Factor	-	(100) Sorption Capacity (Percent)	from Calgon Isotherms @65°F
(e)	g Carbon/Bin/Year	-	(g/Bin/Yr) (Capacity Factor)	

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TRICHLOROETHANE
ADSORPTION ON BPL
ACTIVATED CARBON

For additional information, contact Calgon Carbon Corporation,
Box 717, Pittsburgh, PA 15230-0717 Phone: (412) 787-6700

FIGURE D13-1 SORPTION ISOTHERM FOR CALGON TYPE BPL ACTIVATED CARBON
FOR TRICHLOROETHANE

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TRICHLOROETHYLENE
ADSORPTION ON BPL
ACTIVATED CARBON

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FIGURE D13-2 SORPTION ISOTHERM FOR CALGON TYPE BPL ACTIVATED CARBON
FOR TRICHLOROETHYLENE

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CARBON TETRACHLORIDE
ADSORPTION ON BPL
ACTIVATED CARBON

For additional information, contact the
Activated Carbon Division, Calgon Corporation,
Calgon Center, Box 1346, Pittsburgh, PA 15230.
Phone: (412) 923-2345.

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FIGURE D13-3 SORPTION ISOTHERM FOR CALGON TYPE BPL ACTIVATED CARBON
FOR CARBON TETRACHLORIDE

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METHYLENE CHLORIDE
ADSORPTION ON
TYPE BPL CARBON
(COMPUTER ESTIMATE)

For additional information, contact Calgon Carbon Corporation,
Box 717, Pittsburgh, PA 15230-0717 Phone: (412) 787-6700

FIGURE D13-4 SORPTION ISOTHERM FOR CALGON TYPE BPL ACTIVATED CARBON
FOR METHYLENE CHLORIDE

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**FREON 113
ADSORPTION ON BPL
ACTIVATED CARBON**

For additional information, contact the
Activated Carbon Division, Calgon Corporation,
Calgon Center, Box 1346, Pittsburgh, PA 15230.
Phone: (412) 923-2345.

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**FIGURE D13-5 SORPTION ISOTHERM FOR CALGON TYPE BPL ACTIVATED CARBON
FOR CARBON FREON 113**

END

DATE

FILMED

12/20/93