0078893

CH2M-0802472

Enclosure 3

241-B-103, B-105 AND B-203 WORK FACKAGE AND QUALITY CONTROL ACCEPTANCE INSPECTION

Consisting of 350 pages, including coversheet

attached to 0078890

CLO-WO-08-0796
241-B-103, B-105 and B-203
REPLACE G-1 BREATHER FILTERS WITH NEW RADIAL FILTERS

1.0 SCOPE

[ ] 1.1. Replace the existing 241-B-103, B-105 and B-203 failed G-1 Breather Filters with new Radial Breather Filter Assemblies (Item 350) per ECN-725639 R-0.

Radial Filter Assembly design details are provided on ECN-725616 R-0.

NOTE - The Radial HEPA filter will be installed onto the assembly just outside the Tank Farm fence.

- NS&L has determined that this lift does not have to be classified as "critical."
- This is a standard work order that is medium radiological risk.

2.0 LIMITATIONS and PRECAUTIONS

[ ] 2.1. To ensure adequate contamination control and worker protection, at no time is it acceptable to breach systems containing radioactive materials without the use of engineering controls, respiratory protection and/or appropriate personal protective clothing. Approved engineered controls include: ventilation, containments, glovebags, sleeving, tents, glove boxes, fixatives, damp/dry rags and or spritzing methods. Deviation from this process requires approval by the applicable facility Radiological Control Director and the corresponding Line Management Director.

[ ] 2.2. This work package will utilize radiological limits and controls specified in Radiation Work Permit RWP COF-029.

[ ] 2.3. Do not breach a radioactive system if sustained winds are > 25mph.

- A local wind speed measurement device may be utilized in lieu of Hanford Meteorological Station, provided the reading is taken in an unobstructed location that is representative of the work area.
- Use of a local device and the measured wind speed must be documented in the Work Record (Ref. TFC-ESHQ-ENV-STD-06).

Note: 08-12-08 Scanned/Cd ... =108 pgs (Record ... as of 08-13-08) DT-Clerk

[ ] 2.4. Equipment is decontaminated or contained when removed from tanks.

- Equipment is decontaminated or contained when removed from tanks when >50,000 dpm/100 cm^2 beta/gamma or > 70 dpm/100 cm^2 alpha.
- Swipes will be taken to determine that the surface of the item or the outermost surface of the container are maintained <50,000 dpm/100 cm^2 beta/gamma and < 70 dpm/100 cm^2 alpha.

[ ] 2.5. Donning/Doffing Respiratory Protection in Contamination/High Contamination Areas will be per Attachment B.

[ ] 2.6. Tank Farm Contractor (TFC) Environmental representative and Tank Farm Shift Operations Facility shall be notified, in accordance with TFC-ESHQ-ENV_FS-C-01, "Environmental Notifications", if:

- The initial field count of an air sample with a Beta-Gamma activity is greater than 0.2 DAC and/or
- The initial field count of an air sample with Alpha activity is greater than 5.0 DAC and/or
- A result of a 7 day decay count of air samples with a total Alpha activity is greater than 0.2 DAC.

Elevated workspace air samples that are suspected to be radon or its daughter products are to be reported to the Environmental On-Call list within 24 hours of field count if radon is **NOT** confirmed. If the sample decay rate is indicative of radon, whether or not the sample remains above 5 DAC alpha with in the 24 hour verification period, notification to the Environmental On-Call list is **NOT** required. If the decay rate is not indicative of radon, the Environmental On-Call person **MUST** be notified.

[ ] 2.7. FWS prepare a route map of the vehicle and/or equipment routes and locations prior to entry into the tank farm.

[ ] 2.8. No change to the dome load log is required. Removal of the old filter and replacement with a new Radial Filter assembly results in negligible weight change.

[ ] 2.9. IHT will conduct air sampling and monitoring as per Industrial Hygiene Monitoring and Sampling Plan 7X100-JWJ-07-036 for B Complex Tank Farm Work Activities.

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[ ] 2.10. The installation of radial breather filters does not adversely inhibit the established passive maximum ventilation breathing flow rate of 10 cfm as shown in Technical Evaluation TE-05-020, Rev.4. This flow rate is also considered bounding "for flow rates from other smaller tanks".

[ ] 2.11. The completion of the butterfly valve and radial filter installation shall be completed in a timely manner so as not to exceed 30 days. (Ref. Larry Kripps)

RAD CONTROL Planning

[ ] 2.12. The following controls will be enacted if an HRA is to be posted:

- Ensure health physics technician presence and monitoring during high radiation area or very high radiation area entry to determine the exposure rates to which the individuals are exposed.
- Control personnel access to the high radiation area or very high radiation area. Account for all personnel who have entered the high radiation area or very high radiation areas and verify that personnel have exited.

NOTE 1: Physical access control measures are required for high radiation areas or very high radiation areas that are accessible (capable of being reached by a part of the whole body through an entryway or access point). Physical access would occur through a single access or entrance point (any location through which an individual could gain access to areas controlled for the purposes of radiation protection, including entry or exit portals of sufficient size to permit human entry, regardless of their intended use).

NOTE 2: If a high radiation area or very high radiation area is inaccessible, then there are no requirements that must be met for access controls or for posting a high radiation area or very high radiation area.

- Establish access controls at all posted high radiation areas and very high radiation areas, and also in areas that could become high radiation areas or very high radiation areas during facility work (e.g., excavations near a pipeline involved in a transfer or hot tie-in), until it is confirmed that a high radiation area or very high radiation area does not exist. Once identified, access control shall be in place at all times unless the high radiation source is permanently removed.
- To establish access controls for high radiation areas or very high radiation areas during a job evolution, use the following:

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- Provide continuous direct surveillance (stationing personnel) to prevent unauthorized entry.

- If a new high radiation areas is established for more than 8 hrs and is to be left unattended, ensure completion of the following steps:

- Establish and post area as a high radiation area

- Install physical barriers (e.g., permanent chain link fencing and gates, fabricated walls, or permanent doors) that are secured with keyed locks with positive control over each entry.

NOTE 3: If a nut and bolt or other mechanical closure device is used to secure the access device, it must meet the definition of a secured high radiation area or very high radiation area.

- Provide continuous direct surveillance (stationing personnel) to prevent unauthorized entry.

- Provide continuous electronic surveillance that is capable of preventing unauthorized entry.

- A control device that prevents entry to the area when high radiation levels exist or upon entry causes the radiation level to be reduced below that level defining a high radiation area.

- A device that functions automatically to prevent use or operation of the radiation source or field while individuals are in the area.

If a new high radiation area or very high radiation area is established for more than one week, ensure completion of the following steps:

- Update the facility inventory list of high radiation and very high radiation areas;

- Incorporate required surveillance and surveys into routine survey process in accordance with TFC-ESHQ-RP_MON-P-10

- Develop surveillance schedule for the new high radiation area or very high radiation area.

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3.0 PREREQUISITES

NOTE:
Prerequisites Work steps may be performed in any order and/or concurrently.

[ ] 3.1. **QAT** complete the QC Inspection Data Sheets to accept the HEPA filters for installation.

[ ] 3.2. **QAT ENSURE** all shipping and packing material has been removed from new equipment prior to assembly/installation (IB-06-008).

[ ] 3.3. **APPLY** EIN labels to the assembly.

- B103-WST-FLT-101 and B103-WST-V-103
- B105-WST-FLT-101 and B105-WST-V-103
- B203-WST-FLT-101 and B203-WST-V-103

[ ] 3.4. **ENSURE** labels have been installed on the radial filter weather covers. (Reference ECN-725616 R-0)

Label to read : **"H-2-90718"**

in 1/2" black letters per H-2-90718 Sheet 2, Note7.

[ ] 3.5. **LUBRICATE** bolts prior to installation.

[ ] 3.5.1. **DO NOT USE** "Never Seez" Blue Moly lubricant. (Ref 2-MISC-049)

[ ] 3.6. **PREASSEMBLE** the Radial Filter assemblies (valve and spool piece) in the 2701HV warehouse and stage for the QAT to perform the Radial Flow Breather Filter AG-1 Inspection Checklist.

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[ ] 3.7. **TORQUE** the bolts to **84 +/-5 ft-lbs**
AND

[ ] 3.7.1. QAT **VERIFY** bolt torque at **84 +/-5 ft-lbs**.

[ ] **B-103.** Torque

M&TE # 389-88-01-003 Calibration Due Date 8/2/08

K. Willoughby / K. Willoughby 6/2/08
QAT Signature (Print / Sign) Date

[ ] **B-105.** Torque

M&TE # 389-88-01-003 Calibration Due Date 8/2/08

K Willoughby / K. Willoughby 6/2/08
QAT Signature (Print / Sign) Date

[ ] **B-203.** Torque

M&TE # 389-88-01-003 Calibration Due Date 8/2/08

K. Willoughby / K. Willoughby KW 6/2/08 6/2/08
QAT Signature (Print / Sign) Date

[ ] 3.8. QAT **PERFORM** applicable portions of the Radial Flow Breather Filter AG-1 Inspection Checklist.

[ ] 3.9. FWS **VERIFY** the correct waste containers and supplies are available to perform the work activities as stated on the Waste Planning Checklist. (TO-100-052)

[ ] 3.10. FWS **PERFORM** a pre-job briefing in accordance with TFC-OPS-MAINT-C-02 before field work is performed.

[ ] 3.11. FWS **CONDUCT** a walkdown using the work instructions and Worksite Hazard Analysis with as many of the work crew as possible who will be performing the job to ensure the work instructions/hazard controls are adequate.

4.0 SPECIFIC WORK INSTRUCTIONS

NOTE:
Work steps for individual filters, B-103, B-105 & B-203, may be performed concurrently. The filters can be worked in any order.

4.1. **INSTALL** the Radial HEPA filter, bird screen, and weather cover onto the mounting flange spool piece directly outside the Tank Farm boundary.

4.1.1. **ENSURE** anti-galling material is applied to filter threads (i.e., Gray Teflon Tape).

CAUTION
Cross-threading of filter threads may result in equipment failure.

4.1.2. **USE** caution to ensure filter threads do not become cross-threaded, **AND**

CAREFULLY INSTALL new Radial breather filter to hand-tightness.

4.1.3. **USE** pipe wrench **AND TIGHTEN** Radial breather filter pipe nipple.

4.1.4. **INSTALL** bird screen over new Radial breather filter.

4.1.5. **WHILE** ensuring bird screen alignment up into the weather cover, **INSTALL** weather cover and wing nut.

NOTE - Valve handle normally aligns with inlet pipe when open.

[N] 4.2. **SECURE** the radial filter assembly during transportation to maintain protection of the filter to prevent damage.

[N] 4.3. **TRANSPORT** the filter assemblies in a vertical position.

[N] 4.3.1. FWS **WITNESS** the transport of the HEPA Filters, on the assemblies.

6-4-08
FWS

[N] 4.4. HPT **PERFORM** pre-job radiation and contamination survey of work area.

COF-007-852 6-4-08
RSR (SURVEY) Number Date

[N] 4.4.1. **RECORD** subsequent radiological surveys on the Work Record.

NOTE – LCO 3.2.3 APPLIES TO B-203

The HEPA breather filter isolation valve may be closed for planned activities (e.g., maintenance, HEPA filter replacement)

[ ] 4.5. **For B-203, VERIFY** that the tank headspace flammable gas concentration is ≤ 25% of the LFL. (LFL was verified 04-30-08 on CLO-WO-08-0518 and is due again on 08-29-08).

[N] 4.6. **REMOVE** the ground wire from the breather filter housing and cut or disconnect from the splice point at the flange.

[N] 4.7. **INSTALL** ground cover around the riser.

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[ ] 4.8. **ESTABLISH** ARA in work area.

ENSURE G-1 Filter Housing Is Drained

WARNING

Care should be taken when removing liquids accumulated in filter housing. Removed material should be treated as contaminated. Failure to do so may result in contamination spread.

Absorbent will be added in sufficient quantity to absorb 2 times the amount of liquid expected to be absorbed.

IF more than the expected amount of liquid is found in the filter, additional absorbent will be added in sufficient quantity to absorb 2 times the additional amount of liquid.

[ ] 4.9. **DRAIN** the G-1 filter housing and remove filter as follows:

[ ] 4.9.1. **PLACE** a bag with absorbent material under cap (hot side of filter).

[ ] 4.9.2. **UTILIZING** a damp rag until radiological conditions are verified, **REMOVE** cap from filter housing.

[ ] 4.9.3. **DRAIN** liquid from housing. (1 cup of liquid expected)

[ ] 4.9.4. **REPLACE** the drain cap.

[ ] 4.9.5. **REMOVE** filter access door and drain any accumulated condensate into bag with absorbent pads. (1 quart of liquid expected)

[ ] 4.9.6. **REMOVE** the HEPA filter into a bag with absorbent.

[ ] 4.9.7. **SECURE** the filter access door.

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➢ **Remove the existing Breather Filter Housing Assembly. The existing breather filter will be removed along with the 4" butterfly valve.**

WARNING:

Due to shine from the riser and potential contamination, hands shall be kept away from the open riser as much as possible.

[N] 4.10. **CONTROL** the inside of the riser as an HCA.

[N] 4.11. **CONTROL** the riser opening as an HRA.

[N] 4.12. **REMOVE** fasteners from the flanges at the butterfly valve.

[ ] 4.13. **REMOVE** the existing Breather Filter Assembly (ECN-725639 R-0).

[ ] 4.13.1. **BAG/CONTAIN** the filter assembly for disposal.

[N] 4.13.2. **REMOVE** the old butterfly valve.

[ ] 4.14. **DISESTABLISH** HRA as surveys dictate.

[N] 4.15. **INSTALL** a temporary cover on the riser, when the riser is open and not being worked on.

[N] 4.16. **ENSURE** the new breather filter assembly isolation valve is ***CLOSED.***

(per the Keystone K-LOK valve installation manual, "The valve should be installed in the closed position to insure that the seat and disc are not damaged during installation.")

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[N] 4.17. QAT **PERFORM** applicable portions of the Radial Flow Breather Filter AG-1 Inspection Checklist.

[N] 4.18. **INSTALL** the new radial breather filter assembly with gasket. (Reference ECN-725639 R-0 and ECN-725616 R-0).

[N] 4.18.1. **INSTALL** the bolts and **TORQUE** to **84 +/-5 ft-lbs**.

[N] 4.18.2. QAT **VERIFY** bolt torque at **84 +/-5 ft-lbs**.

[ ] **B-103.** Torque

M&TE # 389-98-01-003 Calibration Due Date 8/2/08

K. Willoughby / K. Willoughby 6/5/08
QAT Signature (Print / Sign) KW 6/5/08 Date

[ ] **B-105.** Torque

M&TE # 389-88-01-003 Calibration Due Date 8/2/08

K. Willoughby / K. Willoughby 6/5/08
QAT Signature (Print / Sign) Date

[ ] **B-203.** Torque

M&TE # 389-88-01-003 Calibration Due Date 8/2/08

K. Willoughby / K. Willoughby 6/4/08
QAT Signature (Print / Sign) Date

[N] 4.19. **ENSURE** the new radial filter assembly isolation valve is *OPEN*.

[N] 4.20. **INFORM** shift manager that breather filter isolation valve is open.

[N] 4.21. HPT **PERFORM** post-job radiation and contamination survey(s) of the work area.

COF - 007852 — RSR Survey Number

6-4-08 — Date

[ ] 4.21.1. **RECORD** subsequent radiological surveys on the Work Record.

[N] 4.22. **ENSURE** the seal loop is filled with Dow Corning 200 fluid, 20 or 100 CST, (MSDS 010835 or 021537).

[N] 4.23. **DOWNPOST** the ARA as surveys dictate.

[N] 4.24. **NOTIFY** Environmental Compliance that the New Radial Filters is installed and the isolation valve is open.

[N] 4.25. **REPEAT** Steps [ ] 4.1 thru [ ] 4.24 for each filter replacement.

[N] 4.26. **PERFORM** work area clean-up.

[N] 4.27. **DISPOSE** of the waste per the Waste Planning Checklist.

[N] 4.28. FWS **RECORD** on the Work Record that the job site has been walked down and the area is orderly and all applicable waste has been placed in the proper containers.

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5.0 POST MAINTENANCE TESTING

[N] 5.1. QAT **RE-VERIFY** torque after approximately 24 hours.

[\ ] **B-103.** Torque to **84 +/-5 ft-lbs**

M&TE # 389-88-01-003 Calibration Due Date 8/2/08

K. WILLOUGHBY / K. Willoughby 6/6/08
QAT Signature (Print / Sign) Date

[\ ] **B-105.** Torque to **84 +/-5 ft-lbs**

M&TE # 389-88-01-003 Calibration Due Date 8/2/08

K. WILLOUGHBY / K. Willoughby 6/6/08
QAT Signature (Print / Sign) Date

[\ ] **B-203.** Torque to **84 +/-5 ft-lbs**

M&TE # 389-88-01-003 Calibration Due Date 8/2/08

K. WILLOUGHBY / K. Willoughby 6/6/08
QAT Signature (Print / Sign) Date

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6.0 RESTORATION AND POST REVIEW

[ ] 6.1. **VERIFY** that a QAT Inspector has signed and completed the Radial Flow Breather Filter AG-1 Inspection Checklist.

K. Willoughby / K. Willoughby 6/6/08
QAT Name / Signature Date

[ ] 6.2. System Engineer **CLOSE** ECN-725639 R-0 and put a copy of the "MODIFICATION COMPLETE" cover page in the work package.

Gregory J. Gaucha / [signature] 6/10/08
Engineer Name / Signature Date

[ ] 6.3. System Engineer **ENSURE** that the old Data Sheets have been discontinued and new Data Sheets have been activated.

Old filter tests	WT-05062, WT-05147, WT-05251
Old filter replacements	WT-06807, WT-06809, WT-06816
New filter replacements	WT-106383, WT-106385, WT-106386

Gregory J. Gaucha / [signature] 6/10/08.
Engineer Name / Signature Date

[ ] 6.4. **FORWARD** the Work Order package to the Operations Engineer for OPS Acceptance.

[ ] 6.5. Operations Engineer **COMPLETE** OPS Acceptance.

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NOTE

The following steps may be worked concurrently, in parallel and/or in any order. RESTORATION AND POST REVIEW steps are not required to be completed to consider the Work Order "Field Work Complete" by the FWS or for Operations Acceptance of the work order. These steps need to be completed prior to Post Review approval.

[ ] 6.6. Radiological Control SME **DETERMINE** if ALARA Review trigger levels were exceeded and if an ALARA Review is required.

SHEILA LAUDISIO / Sheila G Laudisio 6-11-08
Rad Con SME Print/Sign Date

Required: _____ Not Required: ✓

[ ] 6.6.1. As applicable, FWS or Planner schedule and perform an ALARA review meeting to complete as soon as possible, not to exceed 30 calendar days from field work complete.

[ ] 6.7. RADCON SME to **CLOSE** the RWP in the ACES system, if no longer needed.

SHEILA LAUDISIO / Sheila G Laudisio 6-11-08
Rad Con SME Print / Sign Date

[ ] 6.8. ENVIRONMENTAL **PERFORM** closeout review.

Shelly Doss / Shelly Doss 7-21-08
ENVIRONMENTAL Print / Sign Date

[ ] 6.9. **FORWARD** the Work Order package to the Planner for Post Review.

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Work Order: CLO-WO-08-0796

Title: 241-B-103,105,203 REPLACE BFs WITH RADIAL FILTERS

Date Created:	5/12/2008 13:38:07	**Equipment:**	B103-WST-FLT-101	**SC/I:**	☐
WorkFlow:	WO Standard	**Planner:**	Hjellum, Al	**Job Plan:**	
WO Type:	4 - MODIFICATION	**Assigned:**		**Farm/Facility:**	241B
State:	In Approval	**Phase Desig:**		**PM Id:**	
RAD Risk:	Medium	**Flow Status:**	OK	**Frequency:**	
CACN:	501956	**Project Id:**		**Date Reqd:**	6/4/2008 08:08:29
Priority:	4.1 Improvement in conduct of operations			**Route Id:**	

Description:

Replace failed G-1 breather filters at 241-B-103, B-105 and B-203 with radial breather filter assemblies per ECN-725639 R-0. ECN-725616 R-0 clarifies the installation of the butterfly isolation valve.

(Ref PER-2008-0984.)

DT
06-1-08

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Work Order: CLO-WO-08-0796

Title: 241-B-103,105,203 REPLACE BFs WITH RADIAL FILTERS

Step 1 **Of** 1 **Step Id:** 001 **State:** In Approval **Safety Class:**

Sched Start: **Sched Comp:** **Related Step/Link:**

Step Instructions:

Replace failed G-1 breather filters at 241-B-103, B-105 and B-203 with radial breather filter assemblies per ECN-725639.

Assets	Seq	Asset Class	Asset Id	Asset Name	SC/I	Expiration Date
	1	Equipment	B103-WST-FLT-101	FILTER, BREATHER, G-1 HOUSING	☐	

Trades	Crew	Trade Id:	Trade Description:	Workers	Act Hrs.	Delay Code
	Maintenance	C120	Other Crafts	4	2	

Attachments: There are 36 document(s) attached to this work order

Description	Path/Name
Step Attachment	
AG-1 Checklist for Radial Flow Breather Filters	B-103-105-203 Radial Filter AG-1Checklist__971555.doc
AMW Draft AW-1436 B Farm Radial Filters.doc	AMW Draft AW-1436 B Farm Radial Filters__971553.doc
CLO-WO-08-0796 Replace B Farm BFs w Radials 05-27	CLO-WO-08-0796 Replace B Farm BFs w Radials 05-27__971794.doc
Donning-Doffing Attachment B.doc	Donning-Doffing Attachment B__971559.doc
NS&L EVALUATION OF CLO-WO-08-0796.doc	NS&L EVALUATION OF CLO-WO-08-0796__971713.doc
PFWR for B Farm Radial Filters CHG 013-08.doc	B Farm PFWR CHG 013-08__970937.doc
Tanks Not Requiring Silvershield PPE.doc	Tanks Not Requiring Silvershield PPE__970959.doc
Lessons Learned Bulletin IB-06-008.htm	Lessons Learned Bulletin IB-06-008__970946.htm
BOM for CLO-WO-08-0796 Filter Assembly	BOM for CLO-WO-08-0796 Filter Assembly
BOM for CLO-WO-08-0796 HEPA Filter	BOM for CLO-WO-08-0796
CEHA 0508-_____ for CLO-WO-08-0796	CEHA 0508-_____ for CLO-WO-08-0796
ECN-725616 R-0	ECN-725616 R-0
ECN-725639 R-0	ECN-
RWP COF-029	RWP CO-
USQ TF-08-0908-S, Rev. 0. (GCX-3)	USQ TF-08-
MSDS 010835 Dow Corning 200, 100 CST.pdf	MSDS 010835 Dow Corning 200, 100 CST__970948.pdf
MSDS 012664B WD-40.pdf	MSDS 012664B WD-40__970952.pdf
MSDS 020641 Safegard 5022A.pdf	MSDS 020641 Safegard 5022A__970953.pdf
MSDS 021537 Dow Corning 200, 20 CST.pdf	MSDS 021537 Dow Corning 200, 20 CST__970949.pdf
Pictures of old G-1s at B-103-105-203.pdf	Old G-1s at B-103-105-203__970961.pdf
QC Data Sheet for Radial_HEPA_Filter.pdf	Radial_HEPA_Filter_QC Data Sheet__971558.pdf
Route Map for CLO-WO-08-0796.pdf	Route Map for CLO-WO-08-0796__971733.pdf
MSDS 012261 Simple Green.TIF	MSDS 012261 Simple Green__970950.TIF
MSDS 014258 Kroil Penetrating Oil.tif	MSDS 014258 Kroil Penetrating Oil__970951.tif
MSDS 023671 Quick 'n Brite.tif	MSDS 023671 Quick 'n Brite__970954.tif

Alj 5/29/08

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Work Order: CLO-WO-08-0796

Title: 241-B-103,105,203 REPLACE BFs WITH RADIAL FILTERS

Attachments: There are 36 document(s) attached to this work order

Description	Path/Name
Step Attachment	
Dwg H-2-90718 Sht 10	http://apdrmweb.rl.gov/rimvu/default.aspx?id=DA03974768
Dwg H-2-90718 Sht 15	http://apdrmweb.rl.gov/rimvu/default.aspx?id=DA03233613
Dwg H-2-90718 Sht 16	http://apdrmweb.rl.gov/rimvu/default.aspx?id=DA05022697
Dwg H-2-90718 Sht 25	http://apdrmweb.rl.gov/rimvu/default.aspx?id=DA04374433
Ignition Controls Screening.xdf	Ignition Controls Screening__970970.xdf
JHA Checklist	JHA Checklist__970960.xdf
OPS Acceptance.xdf	OPS Acceptance__970955.xdf
OPS Release Form.xdf	OPS Release Form__970956.xdf
Pre-Job A-6002-893 R-1.xdf	Pre-Job A-6002-893 R-1__970957.xdf
WHA_for_B_Farm_Replace_w_Radial.xdf	WHA_for_B_Farm_Replace_w_Radial__971833.xdf
WORK RECORD	WORK RECORD__970958.xdf

Electronic Approvals:

Date	State	Response	Profile	Name	Role
5/12/2008 13:38:08	Ready For Planning	Approved	ret_&_bo_ops_shift_mgr	Ficklin, Jim	
5/22/2008 12:40:24	In Planning	Approved	ret_&_bo_pm_planner	Hjellum, Al	
5/27/2008 16:26:05	In Approval	Approved	ret_&_bo_fws	Johnson, Mark N	bo_field_work_suprv
5/28/2008 09:09:22	In Approval	Approved	ret_&_bo_SEL-EIN_admi	Gauck, Gregory J	ret_&_bo resp. eng.
5/28/2008 13:06:49	In Approval	Approved	ret_&_bo_radcon_&_env	Doss, Shelly D	bo_environmental
5/28/2008 14:33:26	In Approval	Approved	ret_&_bo_rad_con	Holcomb, Stephen	bo_rad_con
5/28/2008 15:48:24	In Approval	Approved	ret_&_bo_pm_planner	Hjellum, Al	bo_planner

FWC

FWS Completed By: [signature] **FWC Date:** 6/11/08 **Update Job Plan (Y/N):** NO

Completed Satisfactorily(yes,no): YES **Asset Condition:** ORC-3

Comments: None

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Work Records

Type	Created By:	Created On:
Status Tracking	Hjellum, Al	5/27/2008 13:52:10

USQ is TF-08-0908-S, Rev. 0. (GCX-3).

NS&L EVALUATION OF CLO-WO-08-0796: Determined that this lift could not result in a significant facility worker hazardous condition, and the lift does not have to be classified as "critical" per the requirements of TFC-ENG-FACSUP-C-25, Rev B-1 and implementing management directive TFC-MD-059, Rev A.

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CLO-WO-08-0796
B-103, B-105 AND B-203 INSTALL RADIAL FILTER (AND BUTTERFLY VALVE)

Attachment
Radial Flow Breather Filter AG-1 Inspection Checklist

Purpose: Visual inspection is used to assess items such as surface condition, alignment of mating surfaces, shape, or evidence of other damage.

Scope: Visual inspections shall be performed on the NEW breather filter assembly components and interconnecting ductwork as outlined in the following checklists (make additional copies as needed). Previously installed/legacy/existing items are not included in the scope of this inspection. The inspections are limited to items that are readily accessible, without disassembly (for example, many items are not easily assessed inside the completed assemblies). Because disassembly is not desirable, especially after installation, the inspections should occur and be documented during fabrication and pre- and post-installation activities (as applicable). Items that were previously inspected (e.g., by the manufacturer) cannot be inspected or are not applicable shall be indicated as such on the checklist, with justification/evidence given in the comments column as appropriate (do not delete items from the checklists).

Acceptance Criteria: Unless otherwise noted in the following checklists, **conditions are considered acceptable when there is no visual indication of improper installation, physical damage, structural distress or degradation that would impair the ability of the component/system to perform its intended function.**

Required Inspector: Quality control shall complete (as applicable) and sign each data sheet.

Originated by:
Signature Required:

RFARIS, TFY — Retrieval Closure Ventilation System Engineer

5-21-08. — Date

AG1 checklist 30

VISUAL INSPECTION CHECKLIST DUCTWORK/RISER ASSEMBLY/ADAPTER SPOOL FOR B-103				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
1	Housing and duct connections (no caulking)	ASME AG-1, Section TA-I-1300 (a)	KW 6/5/08	Mounting flange subassembly- to- riser connection.
2	Provision for opening access doors from both inside and outside	ASME AG-1, Section TA-I-1300 (b)	N/A	By design, there are no doors.
3	Access door seals, gaskets	ASME AG-1, Section TA-I-1300 (c)	N/A	By design, there are no doors.
4	Access door latches	ASME AG-1, Section TA-I-1300 (d)	N/A	By design, there are no doors.
5	Housing internal access ladders and platforms	ASME AG-1, Section TA-I-1300 (e)	N/A	By design, there is no housing.
6	Sample and injection ports, location and caps	ASME AG-1, Section TA-I-1300 (f)	N/A	By design, there are no test ports.
7	Supports and attachments	ASME AG-1, Section TA-I-1300 (g)	N/A	Connection to riser addressed in DW-1. There are no separate supports or attachments.
8	Bolting and fasteners	ASME AG-1, Section TA-I-1300 (h)	KW 6/4/08	1ST TORQUE KW 6-5-08 2ND TORQUE KW 6/6/08
9	Instrumentation connections	ASME AG-1, Section TA-I-1300 (i)	N/A	By design, there are no instrumentation connections.
10	Electrical connections	ASME AG-1, Section TA-I-1300 (j)	N/A	By design, there are no electrical connections.
11	Housing/duct penetration seals	ASME AG-1, Section TA-I-1300 (k)	N/A	By design, there is no housing.

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VISUAL INSPECTION CHECKLIST DUCTWORK/RISER ASSEMBLY/ADAPTER SPOOL FOR B-103				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
12	Loop seals (water level), drain connections	ASME AG-1, Section TA-I-1300 (l)	N/A	By design, there are no loop seals or drain lines.
13	Lighting conduits, socket housing seals (flush mounted)	ASME AG-1, Section TA-I-1300 (m)	N/A	By design, there are no lighting conduits.
14	HEPA/adsorber mounting frame continuous seal welds	ASME AG-1, Section TA-I-1300 (n)	N/A	By design, there is no mounting frame.
15	Mounting frame penetrations seal welded	ASME AG-1, Section TA-I-1300 (o)	N/A	By design, there is no mounting frame.
16	Mounting frame seating surface (weld splatter, flatness, scratches)	ASME AG-1, Section TA-I-1300 (p)	KW 6/2/08	By design, there is no mounting frame. This is for inspection of the threaded hole in the flange.
17	Sample canister installation	ASME AG-1, Section TA-I-1300 (q)	N/A	By design, there is no sample canister.
18	Mounting frame clamping devices	ASME AG-1, Section TA-I-1300 (r)	N/A	By design, there is no mounting frame.
19	As built configuration in accordance with design drawings	ASME AG-1, Section TA-I-1300 (s)	N/A (completed via other inspection or process)	Normal engineering and work control processes perform this function.
20	Provisions for access for performing tests and maintenance	ASME AG-1, Section TA-I-1300 (t)	KW 6/5/08	Verify filter will be accessible for replacement. No tests required.

VISUAL INSPECTION CHECKLIST DUCTWORK/RISER ASSEMBLY/ADAPTER SPOOL FOR B-103				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
21	Lighting for test and maintenance available	ASME AG-1, Section TA-I-1300 (u)	N/A	Not applicable to this assembly (facility or portable lighting used as necessary).
Quality Control (print name, signature, date): K. WILLOUGHBY / K Willoughby 6/6/08				

VISUAL INSPECTION CHECKLIST DAMPER/VALVE B103-WST-V-103				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
DM-1	Housing and duct interface	ASME AG-1, Section TA-I-1200 (a)	KW 6/5/08	No housing. Duct interface only.
DM-2	Actuator linkage, motor, controller	ASME AG-1, Section TA-I-1200 (b)	N/A	Valve design does not have any actuator linkages, motors, or controller.
DM-3	Interferences with moving parts	ASME AG-1, Section TA-I-1200 (c)	N/A (completed via other inspection or process)	The only moving parts are internal to the damper, verified through functional testing.
DM-4	Damper shaft seal	ASME AG-1, Section TA-I-1200 (d)	N/A	Valve design has no damper shaft.
DM-5	Blade edge seals, damper seat	ASME AG-1, Section TA-I-1200 (e)	N/A (completed via other inspection or process)	Seal integrity is verified by testing per ASME B16.34 and verified during procurement activities. Vacuum decay testing also ensures adequate seal during field installation.
DM-6	Limit switches	ASME AG-1, Section TA-I-1200 (f)	N/A	Valve design has no limit switches.
DM-7	Supports and attachments	ASME AG-1, Section TA-I-1200 (g)	N/A	Valve design has no supports or attachments other than its interface with the duct (wye assembly) to which it bolts (covered in DM-1).
DM-8	Bolting and fasteners	ASME AG-1, Section TA-I-1200 (h)	KW 6/5/08	1ST TORQUE KW 6/12/08 2ND TORQUE KW 6/5/08
DM-9	Instrumentation	ASME AG-1, Section TA-I-1200 (i)	N/A	Valve design has no instrumentation.

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VISUAL INSPECTION CHECKLIST DAMPER/VALVE B103-WST-V-103				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
DM-10	Electrical connections	ASME AG-1, Section TA-I-1200 (j)	N/A	Valve design has no electrical connections.
DM-11	Pneumatic connections	ASME AG-1, Section TA-I-1200 (k)	N/A	Valve design has no pneumatic connections.
DM-12	As built configuration in accordance with design drawings	ASME AG-1, Section TA-I-1200 (l)	N/A (completed via other inspection or process)	Normal engineering and work control processes perform this function.
DM-13	Damper nameplate	ASME AG-1, Section TA-I-1200 (m)	KW 6/2/08	See valve damper note on H-2-90718 Sht.10 latest rev. See Item number 171 on Sheet 15.
DM-14	Provisions for access for performing tests and maintenance	ASME AG-1, Section TA-I-1200 (n)	KW 6/5/08	No field testing required. Maintenance will consist of filter replacement.
Quality Control (print name, signature, date): K. Willoughby / K. [signature] 6/5/08				

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VISUAL INSPECTION CHECKLIST DUCTWORK/RISER ASSEMBLY/ADAPTER SPOOL FOR B-105				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
1	Housing and duct connections (no caulking)	ASME AG-1, Section TA-I-1300 (a)	KW 6/5/08	Mounting flange subassembly- to- riser connection.
2	Provision for opening access doors from both inside and outside	ASME AG-1, Section TA-I-1300 (b)	N/A	By design, there are no doors.
3	Access door seals, gaskets	ASME AG-1, Section TA-I-1300 (c)	N/A	By design, there are no doors.
4	Access door latches	ASME AG-1, Section TA-I-1300 (d)	N/A	By design, there are no doors.
5	Housing internal access ladders and platforms	ASME AG-1, Section TA-I-1300 (e)	N/A	By design, there is no housing.
6	Sample and injection ports, location and caps	ASME AG-1, Section TA-I-1300 (f)	N/A	By design, there are no test ports.
7	Supports and attachments	ASME AG-1, Section TA-I-1300 (g)	N/A	Connection to riser addressed in DW-1. There are no separate supports or attachments.
8	Bolting and fasteners	ASME AG-1, Section TA-I-1300 (h)	KW 6/6/08	~~1ST TORQUE~~ KW 6-2-08 1ST TORQUE KW 6-5-08 2ND TORQUE KW 6-6-08
9	Instrumentation connections	ASME AG-1, Section TA-I-1300 (i)	N/A	By design, there are no instrumentation connections.
10	Electrical connections	ASME AG-1, Section TA-I-1300 (j)	N/A	By design, there are no electrical connections.
11	Housing/duct penetration seals	ASME AG-1, Section TA-I-1300 (k)	N/A	By design, there is no housing.

VISUAL INSPECTION CHECKLIST DUCTWORK/RISER ASSEMBLY/ADAPTER SPOOL FOR B-105				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
12	Loop seals (water level), drain connections	ASME AG-1, Section TA-I-1300 (l)	N/A	By design, there are no loop seals or drain lines.
13	Lighting conduits, socket housing seals (flush mounted)	ASME AG-1, Section TA-I-1300 (m)	N/A	By design, there are no lighting conduits.
14	HEPA/adsorber mounting frame continuous seal welds	ASME AG-1, Section TA-I-1300 (n)	N/A	By design, there is no mounting frame.
15	Mounting frame penetrations seal welded	ASME AG-1, Section TA-I-1300 (o)	N/A	By design, there is no mounting frame.
16	Mounting frame seating surface (weld splatter, flatness, scratches)	ASME AG-1, Section TA-I-1300 (p)	KW 6/2/08	By design, there is no mounting frame. This is for inspection of the threaded hole in the flange.
17	Sample canister installation	ASME AG-1, Section TA-I-1300 (q)	N/A	By design, there is no sample canister.
18	Mounting frame clamping devices	ASME AG-1, Section TA-I-1300 (r)	N/A	By design, there is no mounting frame.
19	As built configuration in accordance with design drawings	ASME AG-1, Section TA-I-1300 (s)	N/A (completed via other inspection or process)	Normal engineering and work control processes perform this function.
20	Provisions for access for performing tests and maintenance	ASME AG-1, Section TA-I-1300 (t)	KW 6/5/08	Verify filter will be accessible for replacement. No tests required.

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VISUAL INSPECTION CHECKLIST DUCTWORK/RISER ASSEMBLY/ADAPTER SPOOL FOR B-105				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
21	Lighting for test and maintenance available	ASME AG-1, Section TA-I-1300 (u)	N/A	Not applicable to this assembly (facility or portable lighting used as necessary).
Quality Control (print name, signature, date): K. Willoughby K. Willoughby 6/6/08				

VISUAL INSPECTION CHECKLIST DAMPER/VALVE B105-WST-V-103				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
DM-1	Housing and duct interface	ASME AG-1, Section TA-I-1200 (a)	KW 6/5/08	No housing. Duct interface only.
DM-2	Actuator linkage, motor, controller	ASME AG-1, Section TA-I-1200 (b)	N/A	Valve design does not have any actuator linkages, motors, or controller.
DM-3	Interferences with moving parts	ASME AG-1, Section TA-I-1200 (c)	N/A (completed via other inspection or process)	The only moving parts are internal to the damper, verified through functional testing.
DM-4	Damper shaft seal	ASME AG-1, Section TA-I-1200 (d)	N/A	Valve design has no damper shaft.
DM-5	Blade edge seals, damper seat	ASME AG-1, Section TA-I-1200 (e)	N/A (completed via other inspection or process)	Seal integrity is verified by testing per ASME B16.34 and verified during procurement activities. Vacuum decay testing also ensures adequate seal during field installation.
DM-6	Limit switches	ASME AG-1, Section TA-I-1200 (f)	N/A	Valve design has no limit switches.
DM-7	Supports and attachments	ASME AG-1, Section TA-I-1200 (g)	N/A	Valve design has no supports or attachments other than its interface with the duct (wye assembly) to which it bolts (covered in DM-1).
DM-8	Bolting and fasteners	ASME AG-1, Section TA-I-1200 (h)	KW 6/5/08	1ST TORQUE KW 6/2/08 2ND TORQUE KW 6/5/08
DM-9	Instrumentation	ASME AG-1, Section TA-I-1200 (i)	N/A	Valve design has no instrumentation.

VISUAL INSPECTION CHECKLIST DAMPER/VALVE B105-WST-V-103				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
DM-10	Electrical connections	ASME AG-1, Section TA-I-1200 (j)	N/A	Valve design has no electrical connections.
DM-11	Pneumatic connections	ASME AG-1, Section TA-I-1200 (k)	N/A	Valve design has no pneumatic connections.
DM-12	As built configuration in accordance with design drawings	ASME AG-1, Section TA-I-1200 (l)	N/A (completed via other inspection or process)	Normal engineering and work control processes perform this function.
DM-13	Damper nameplate	ASME AG-1, Section TA-I-1200 (m)	KW 6/2/08	See valve damper note on H-2-90718 Sht.10 latest rev. See Item number 171 on Sheet 15.
DM-14	Provisions for access for performing tests and maintenance	ASME AG-1, Section TA-I-1200 (n)	KW 6/5/08	No field testing required. Maintenance will consist of filter replacement.
Quality Control (print name, signature, date): K. WILCOUGHBY / K. Wilcoughby 6/5/08				

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VISUAL INSPECTION CHECKLIST DUCTWORK/RISER ASSEMBLY/ADAPTER SPOOL FOR B-203				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
1	Housing and duct connections (no caulking)	ASME AG-1, Section TA-I-1300 (a)	KW 6/4/08	Mounting flange subassembly- to- riser connection.
2	Provision for opening access doors from both inside and outside	ASME AG-1, Section TA-I-1300 (b)	N/A	By design, there are no doors.
3	Access door seals, gaskets	ASME AG-1, Section TA-I-1300 (c)	N/A	By design, there are no doors.
4	Access door latches	ASME AG-1, Section TA-I-1300 (d)	N/A	By design, there are no doors.
5	Housing internal access ladders and platforms	ASME AG-1, Section TA-I-1300 (e)	N/A	By design, there is no housing.
6	Sample and injection ports, location and caps	ASME AG-1, Section TA-I-1300 (f)	N/A	By design, there are no test ports.
7	Supports and attachments	ASME AG-1, Section TA-I-1300 (g)	N/A	Connection to riser addressed in DW-1. There are no separate supports or attachments.
8	Bolting and fasteners	ASME AG-1, Section TA-I-1300 (h)	KW 6/6/08	~~1ST TORQUE~~ KW 6/2/08 1ST TORQUE KW 6/4/08 2ND TORQUE KW 6/6/08
9	Instrumentation connections	ASME AG-1, Section TA-I-1300 (i)	N/A	By design, there are no instrumentation connections.
10	Electrical connections	ASME AG-1, Section TA-I-1300 (j)	N/A	By design, there are no electrical connections.

VISUAL INSPECTION CHECKLIST DUCTWORK/RISER ASSEMBLY/ADAPTER SPOOL FOR B-203				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
11	Housing/duct penetration seals	ASME AG-1, Section TA-I-1300 (k)	N/A	By design, there is no housing.
12	Loop seals (water level), drain connections	ASME AG-1, Section TA-I-1300 (l)	N/A	By design, there are no loop seals or drain lines.
13	Lighting conduits, socket housing seals (flush mounted)	ASME AG-1, Section TA-I-1300 (m)	N/A	By design, there are no lighting conduits.
14	HEPA/adsorber mounting frame continuous seal welds	ASME AG-1, Section TA-I-1300 (n)	N/A	By design, there is no mounting frame.
15	Mounting frame penetrations seal welded	ASME AG-1, Section TA-I-1300 (o)	N/A	By design, there is no mounting frame.
16	Mounting frame seating surface (weld splatter, flatness, scratches)	ASME AG-1, Section TA-I-1300 (p)	KW 6/2/08	By design, there is no mounting frame. This is for inspection of the threaded hole in the flange.
17	Sample canister installation	ASME AG-1, Section TA-I-1300 (q)	N/A	By design, there is no sample canister.
18	Mounting frame clamping devices	ASME AG-1, Section TA-I-1300 (r)	N/A	By design, there is no mounting frame.
19	As built configuration in accordance with design drawings	ASME AG-1, Section TA-I-1300 (s)	N/A (completed via other inspection or process)	Normal engineering and work control processes perform this function.

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VISUAL INSPECTION CHECKLIST DUCTWORK/RISER ASSEMBLY/ADAPTER SPOOL FOR B-203				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
20	Provisions for access for performing tests and maintenance	ASME AG-1, Section TA-I-1300 (t)	KW 6/4/08	Verify filter will be accessible for replacement. No tests required.
21	Lighting for test and maintenance available	ASME AG-1, Section TA-I-1300 (u)	N/A	Not applicable to this assembly (facility or portable lighting used as necessary).
Quality Control (print name, signature, date): K. Willoughby / K Willoughby 6/6/08				

VISUAL INSPECTION CHECKLIST DAMPER/VALVE B203-WST-V-103				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
DM-1	Housing and duct interface	ASME AG-1, Section TA-I-1200 (a)	KW 6/4/08	No housing. Duct interface only.
DM-2	Actuator linkage, motor, controller	ASME AG-1, Section TA-I-1200 (b)	N/A	Valve design does not have any actuator linkages, motors, or controller.
DM-3	Interferences with moving parts	ASME AG-1, Section TA-I-1200 (c)	N/A (completed via other inspection or process)	The only moving parts are internal to the damper, verified through functional testing.
DM-4	Damper shaft seal	ASME AG-1, Section TA-I-1200 (d)	N/A	Valve design has no damper shaft.
DM-5	Blade edge seals, damper seat	ASME AG-1, Section TA-I-1200 (e)	N/A (completed via other inspection or process)	Seal integrity is verified by testing per ASME B16.34 and verified during procurement activities. Vacuum decay testing also ensures adequate seal during field installation.
DM-6	Limit switches	ASME AG-1, Section TA-I-1200 (f)	N/A	Valve design has no limit switches.
DM-7	Supports and attachments	ASME AG-1, Section TA-I-1200 (g)	N/A	Valve design has no supports or attachments other than its interface with the duct (wye assembly) to which it bolts (covered in DM-1).
DM-8	Bolting and fasteners	ASME AG-1, Section TA-I-1200 (h)	KW 6/4/08	1ST TORQUE KW 6-2-08 2ND TORQUE KW 6/4/08
DM-9	Instrumentation	ASME AG-1, Section TA-I-1200 (i)	N/A	Valve design has no instrumentation.

VISUAL INSPECTION CHECKLIST DAMPER/VALVE B203-WST-V-103				
Item #	**Inspection Item**	**Requirement Reference**	**QC Acceptance (initial & date)**	**Comments (use comments continuation sheet as needed)**
DM-10	Electrical connections	ASME AG-1, Section TA-I-1200 (j)	N/A	Valve design has no electrical connections.
DM-11	Pneumatic connections	ASME AG-1, Section TA-I-1200 (k)	N/A	Valve design has no pneumatic connections.
DM-12	As built configuration in accordance with design drawings	ASME AG-1, Section TA-I-1200 (l)	N/A (completed via other inspection or process)	Normal engineering and work control processes perform this function.
DM-13	Damper nameplate	ASME AG-1, Section TA-I-1200 (m)	KW 6/2/08	See valve damper note on H-2-90718 Sht.10 latest rev. See Item number 171 on Sheet 15.
DM-14	Provisions for access for performing tests and maintenance	ASME AG-1, Section TA-I-1200 (n)	KW 6/4/08	No field testing required. Maintenance will consist of filter replacement.
Quality Control (print name, signature, date): K. WILLOUGHBY / K. Willoughby 6/4/08				

Hjellum, Allan D (Al)

Subject: FW: NS&L EVALUATION OF CLO-WO-08-0796, REPLACE G-1 BREATHER FILTERS WITH NEW RADIAL FILTERS ON B-103, B-105, AND B-203

Importance: High

From: Harris, John P III
Sent: Wednesday, May 21, 2008 1:12 PM
To: Hull, Kevin J; Gauck, Gregory J
Cc: Eppler, Larry L; Kripps, Lawrence J; Goetz, Thomas G (Tom)
Subject: NS&L EVALUATION OF CLO-WO-08-0796, REPLACE G-1 BREATHER FILTERS WITH NEW RADIAL FILTERS ON B-103, B-105, AND B-203
Importance: High

Kevin,

I've reviewed CLO-WO-08-0796, as you requested, to determine whether the replacement of these breather filters would require the crane lifts to be deemed "critical lifts" or not, per the requirements of TFC-ENG-FACSUP-C-25, Rev B-1 and implementing management directive TFC-MD-059, Rev A.

Because of the conditions you've described to me in our conversations (i.e., that the weight of the old breather filter assemblies are on the order of 250 lbs, the weight of the new radial filters are on the order of 12 lbs, and that the height of the lift is on the order of 10 ft), combined with the fact that the only MAR (material at risk) within the old assembly would be approximately one gallon of condensate, I've determined that this lift could not result in a significant facility worker hazardous condition, and the lift does not have to be classified as "critical."

I'm basing this determination on the following:

Condensate is not considered to be waste, per the following definition in Section 1.1 (on page 1.1-7) of the Tank Farm TSR:

"Condensate generated within tank farm systems (e.g., DST primary tank ventilation systems, SST portable exhausters, SST breather filter assemblies, inactive ventilation systems, instrument lines), including corrosion inhibiting chemicals added to the AZ301-COND-TK-001 condensate tank, caustic solutions used to flush ventilation systems, and contaminants (e.g., precipitated condensate materials such as ammonium nitrate and evaporated condensate residues that may be redissolved) is not considered WASTE as defined in these TSRs."

Therefore, the lift does not contain ≥ 1 gallon of "waste," and an evaluation of Table 1 of MD-059 shows that the weight and height of the lift could not impact the 100 or 200 series SSTs in the vicinity of the lift or any waste transfer-associated structures (since there is less than the listed 2 liters of waste). The lift does not, therefore, present a significant facility worker hazard.

An evaluation of the hazard database report, RPP-15188, has shown that this lift is completely encompassed by listed hazardous conditions CRN-09-1, CRN-10-1, CRN-20-@1, and CRN-20-@2, none of which list the facility worker hazard as significant.

If you have any questions on this evaluation, please contact me at 372-1237.

John Harris

Nuclear Safety & Licensing

NS&L EVAL

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RPP WORK RECORD	1. Document Number: CLO-WO-08-0796

2. Work Item Title: 241-B-103, 105 & 203 REPLACE G-1 BREATHER FILTERS WITH RADIAL FILTERS

pg 1/

Date	Turnover, Problem Description, Action Taken	Feed Back (X)	Name	Craft/ Resource Type	Hours
5/29/08	Assembled valves and spool pieces for radial breather filters. Release for days Monday to perform prep work in B farm		[signature]	FWS	
6-2-08	Held pre job safety meeting SM crafty assembled new radial filter hardware with QAT present in the step. Stop work used after lunch - (Concerns with change in HOT plan from SCBA to APR w/ GME cartridge). We plan to begin work tomorrow.		[signature]		
6-3-08	Held pre job - Management committed to using supplied air in B Farm to perform work. Stop work was issued by workers stating that we should use APR CEIM sampling plan with APR GME P100 cartridge and voluntary use of SCBA. Resolved stop work. (Senior Management made a commitment that PPE will not be reduced until fully completing the form CAM sampling project. Will continue work tomorrow.		[signature]		

Summary by Craft/Resource Type

Craft/Resource Type	Total Hours	Craft/Resource Type	Total Hours

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RPP WORK RECORD	1. Document Number: CLO-WO-08-0796

2. Work Item Title: 241-B-103, 105 & 203 REPLACE G-1 BREATHER FILTERS WITH RADIAL FILTERS

PG 2/

Date	Turnover, Problem Description, Action Taken	Feed Back (X)	Name	Craft/ Resource Type	Hours
6-4-08	At B-203 - Set up ARA - Removed G1 breather filter and housing and installed a new radial filter assembly. Isolation value is open - B.O shift office notified, Also notified Environmental of new installation. Located crane to perform work on B-103 and B-105, Please release for tomorrow.				
6/5/08	Removed G-1 filter housings from B-103 + 105. Installed Radial filters at both locations. Opened isolation valves and notified shift.			F-WS	
6/5/08	Cleaned the work area.			F-WS	
6/5/08	Release for days Friday to torque bolts at 203, 103 and 105 B.			F-WS	
6/6/08	Completed torques at 203, 103 & 105.			F-WS	

Summary by Craft/Resource Type

Craft/Resource Type	Total Hours	Craft/Resource Type	Total Hours

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CH2M HILL
ATTENDANCE ROSTER

Subject: CLO-WO-08-0796 AND (B-103,105,203)
CLO-WO-06-000156 (BY-110)
TABLETOP WALKDOWN + PLANNING MEETING

Date: 5/21/08

Leader: MARK JOHNSON

NAME (Print)	Signature	Position/Title	Organization
AL HJELLUM		PLANNER	CH2M
Mark Johnson		FWS	CHG B.O.
K. WILLOUGHBY		QC	CHG BO
D.L. MERRILL		IH	BO B&H
S.B. Holcomb		RadCon SME	BOW
J. LOCHRIDGE		NCO	BO

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RADIOLOGICAL WORK PERMIT

Contractor:	RWP Number
CH2M HILL Hanford Group, Inc.	COF-029 Rev 002

General: [ ] Job Specific: [X]	Start Date	End Date	Technical Document Number(s):	AMW Number
	06/5/2008	12/4/2008	CLO-WO-08-0796	AW-1436

Job Location: 200E/241-B/B-103,B-106,B-203

Brief Job Description and Type of Area: Replace G-1 Breather Filters with New Radial Filters(RA,HRA,CA,HCA,ARA)

Radiation Emitted	Estimated Dose Rates	Estimated Contamination Levels	Job Dose Estimate	Risk Value
[X] Alpha [X] Beta [X] Gamma [ ] Neutrons	General Area: 0.5 mrem/hr Maximum Contact: 0.5 mrem/hr Radiological Worker Training Req. [ ] I [X] II	Beta/Gamma: <1000 dpm/100 cm² Alpha: < 20 dpm/100 cm²	<200 person-mrem	MEDIUM

Internal Dosimetry Requirements: [ ] 3 minute WBC [X] 10 minute WBC [SI 5] Urinalysis/Isotopes [SI 5] Chest Count

DOSIMETRY		PERSONAL PROTECTIVE EQUIPMENT				SURVEY REQUIREMENTS	
X	HSD-TLD	X	Coveralls		Shoe Covers	SI 8	Grab Air Sampling Required
	HCND-TLD		Waterproof Suit	X	Canvas Boots	SI 8	Lapel Air Sampling Required
X	Pocket Dosimeter		Goretex Suit	X	Rubber Overshoes	SI 7	Auto. Survey Device
SI 5	Electronic Dosimeter		Cap		Rubber Boots	SI 7	Self Survey (if qualified)
SI 5	Finger Rings	SI 6	Hood		Face Shield		HPT Exit Survey Required
	Time Keeping	SI 6	Surgeon's Gloves	SI-6	Full Face Respirator		
X	Entry Control System	SI 6	Leather Gloves		PAPR	HPT COVERAGE	
	Brick	SI 6	Canvas & Surgeon's Gloves		Supplied Air Respirator	SI 4	Continuous
	-Day ACES Auth.		Waterproof Gloves		SCBA	SI 4	Intermittent
		SI 6	Arm Sleeves		Undressing Assistance		
		SI 3	Leaded Gloves				

SPECIAL INSTRUCTIONS

1. **VOID LIMITS**
   - **HRA:** ≥ 1000 mrem/hr @ 30 cm from open riser
   - **RA:** Whole Body dose rate ≥ 100 mrem/hr @ 30 cm.
   - **CA:** General area removable contamination levels ≥ 100,000 dpm/100 cm² beta-gamma or ≥ 210 dpm/100 cm² alpha.
   - **HCA:** General area removable contamination ≥ 400,000 dpm/100cm² Beta-Gamma or ≥ 420 dpm/100cm² Alpha.
   - **Extremities:** ≥ 8 Rad/hr (Open Window, Uncorrected)
2. **SAFE CONDITION LEVELS**
   IF a Safe Condition Level is met, stop normal work activities, place the work area in a stable condition, perform the actions stated within the associated Safe Condition Level AND notify the RadCon First Line Manager and Shift Operations Manager that a Safe Condition Level was reached or exceeded.
   - **RA:** Whole body dose rate ≥ 80 mrem/hr, establish/post HRA boundary and institute HRA controls as specified in the work document..
   - **CA:** General area removable contamination levels ≥ 80,000 dpm/100cm² beta-gamma or ≥ 140 dpm/100cm² alpha; establish/post HCA boundary and secure work activities.
   - **HCA:** General area removable contamination ≥ 200,000 dpm/100cm² Beta-Gamma or ≥ [illegible] dpm/100cm² Alpha, apply fixative, cover or decontaminate to less than the actic. levels
   - **Extremities:** ≥ 2500 mrad/hr(Open Window, Uncorrected) limit time in area and/or apply shielding using approved methods i.e. , distance - long reach tools.
3. **ACTION LEVELS**
   - **CA:** General area removable contamination levels ≥ 50,000 dpm/100cm² beta-gamma or ≥ 70 dpm/100cm² alpha, decontaminate or apply fixative to reduce contamination to below these levels prior to continuing work activities.
   - **HCA:** General area removable contamination ≥ 100,000 dpm/100cm² beta-gamma or ≥ 100 dpm/100cm² alpha, bag, apply fixative or decontaminate to below these levels.
   - **Extremities:** ≥ 250 mrad/hr(Open Window, Uncorrected) implement beta controls i.e. leaded gloves, rubber matting.
4. **HPT COVERAGE**
   - Continuous HPT coverage is required when removing/replacing filter components
   - Intermittent HPT coverage is required during set-up and clean-up
5. **DOSIMETRY/ACES**
   - Personnel performing hands on work with contaminated components shall wear finger rings and shall ACE in with the appropriate GW or WW Role and the COBIO Role.
   - Personnel working in HRA shall wear an electronic dosimeter with the maximum dose alarm set at 80% of the remaining ACL or 100 mrem, whichever is more limiting and the dose rate alarm set at 50 mrem/hr.
   - Personnel wearing respiratory protection for radiological purposes shall ACE in with the appropriate respirator role.
6. **PERSONAL PROTECTIVE EQUIPMENT**
   - **HCA:** Arm sleeves and an additional pair of gloves required for reaching inside HCA.
   - **CA:** Single set of PPE with surgeons gloves and canvas, leather or canners gloves required for entry.
   - Minimum respiratory requirements for radiation protection is an APR with a combination filter
   - A hood will be required when:
     - a worker's head has a potential to contact contaminated surfaces.
     - contamination may drop from above due to overhead work.
     - When working in an ARA
7. **SURVEY**
   - **Beta-Gamma and Alpha** surveys required for all aspects of this work, including personnel and material surveys.
   - **Auto Survey Device (ASD) requirements:**
     - If ASD is inoperable or unavailable, perform Beta-Gamma and Alpha whole body surveys. Perform a follow-up survey in an operable ASD.
     - If ASD does not have alpha survey capabilities, perform a whole body Alpha survey prior to entering the ASD if not performed in bullet 1.
   - HPT survey required prior to donning/doffing respirators in a CA
8. **AIR SAMPLING**
   - Work place grab air sampling required when removing/replacing filter components
   - Lapel air sampling required for a representative amount of personnel wearing respiratory protection for radiological purposes
9. **SPECIAL PREJOB BRIEFING**
   - None required
10. **OTHER**
    - N/A

RWP Prepared By: R. Cooper		Phone: 373-1263	HPT Phone: 373-3353, 373-0303			
Line Mgt.	Print: P.M. Howard Sign:			Phone: 438-9091	Date: 6/5/08	
RC Sup. Initial:	RC Dir.	Print: G.W. DAVIS FOR P.B. BRANNEN Sign: 06/05/08 08:15		Phone: 3-4564	Date: 06/05/08	
Acknowledged by:	AJRG Chair (High Risk)	Print: Sign:	Date:	Other:	Print: Sign:	Date:
RWP Field Change Approvals:	Line Mgt.	Print: Sign:	Date:	RC Mgt.	Print: Sign:	Date:

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ALARA MANAGEMENT WORKSHEET (AMW)

AMW Number	Work Package No./Procedure	Date	Page 1 of 6
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PART I ADMINISTRATIVE	RWP Number	Survey Number	Area/Facility/Location
	COF-029	COF-006551	200E/241-B/B-103,106,203

Job Title/Description of Work:

Replace G-1 Breather Filters with New Radial Filters

Identify what triggered the completion of this AMW:

☐ Estimated dose >1 rem	☐ Potential release of radioactive material >DOE 232.1 requirements	
☐ Work area dose rate >1 rem/hr	☐ Predicted airborne radioactivity in excess of the DAC or integrated exposure of 200 DAC/hrs	
☐ Management request	☐ First time or infrequent activity (High Risk Review Required) (RadCon Oversight Required)	
☐ Radiological Control request	☐ Extremity dose	
☒ Removable contamination in excess of 100 times Table 2-2	☒ Other	TFC-ESHQ-RP_RWP-C-03, ALARA Work Planning, requirement, medium radiological risk work.

PART II REVIEW

A. What is the radiological risk classification and reason for the work activity?

- In accordance with the guidance contained in TFC-ESHQ-RP_RWP-C-03, "ALARA Work Planning", this task has been determined to be MEDIUM radiological risk.
- The medium risk category has been assigned due to:
  - Normal repetitive work in areas where removable contamination is estimated to be $\geq$100,000 to $\leq$1,000,000 dpm/100cm^2 Beta-Gamma or $\geq$2,000 to $\leq$20,000 dpm/ 100cm^2 Alpha in the general area, or in the work area such that the workers' personal protective equipment will be expected to come in contact with this level of contamination
  - Work in, or that may result in creation of, an airborne radioactivity area
- The completion of this work activity will result in B-103, B-106, and B-203 being equipped with new radial breather filters.

B. Can additional or temporary shielding be used to reduce dose rates?

- Survey COF-006551 indicates that dose rates are sufficiently low as to preclude the need for additional or temporary shielding.

C. What time-saving procedure techniques, training, monitoring, mock-ups, or additional dosimetry will be used? (Need for and level of mockup approved. N/A Ops Dir)

- Time-saving procedure techniques:
  - None
- Training/ Mockups:
  - The work steps in this evolution involve activities which are routinely performed by the workers. Details of the work will be discussed in the planning process, however, no mock-ups or specific training is required.
- Monitoring:
  - Continuous HPT coverage is required when removing/replacing filter components.
  - Intermittent HPT coverage is required for set-up and clean-up work.
- Additional Dosimetry:
  - Personnel performing hands-on work with contaminated components shall wear finger rings.

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ALARA MANAGEMENT WORKSHEET (AMW)

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D. What alternatives can be employed (e.g., special tools, ventilation, cross-crafting, remote tools, containments, engineered controls) to reduce the amount of time in the work area?

- None

E. List/describe measures employed to control contamination and the generation of airborne radioactivity, as applicable.

- The area around each Breather Filter Assembly will be covered with a ground cover
- All existing breather filter components will be bagged as they are removed and disposed of.
- Since the entire B Farm complex is a VCZ, this work will be performed in SCBA.
  - Donning/doffing of respiratory protection may be required in a CA/HCA. If so, provisions of TFC-ESHQ-RP_RWP-C-03 section 4.3.5 will be followed
  - The minimum respiratory requirement for radiation protection is an APR with a particulate filter.
- Any standing water inside the filter housing will be drained into a bag containing at least twice the amount of absorbent needed to absorb the expected amount of liquid (~1 quart).
- The inside of the open riser will be controlled as a HCA. The area will be controlled as a HRA until survey results prove otherwise.
  - Should a HRA occur, the contingency plans in the Work Document will be followed
- General area contamination levels outside the breather filter assembly $\geq$50,000 dpm/100cm^2 Beta-Gamma or $\geq$70 dpm/ 100cm^2 Alpha will be decontaminated to below these levels.

F. Complete the dose estimate. What are the person-hours and collective/individual dose estimates for the work activity?

- Discussions with the FWS regarding time and manpower needs have established the following criteria:
  - Crew Size – 8 (4 ops., 2 HPT, 1 IHT, 1FWS)
  - Time of job 2 hrs
  - Dose rate in area –0.5 mrem (See Sec. IIIB for dose rate information)

8 persons X 2 hours X 0.5 mrem/hr = 8 mrem per filter X 3 filters =24 mrem for job

G. What measures have been identified for minimization and disposal of radioactive waste?

- Radioactive waste will be handled according to the provisions of procedure TO-100-052, "Perform Waste Generation, Segregation and Accumulation".
- The Field Work Supervisor will ensure only necessary equipment and material will be allowed into controlled radiological areas.

ALARA MANAGEMENT WORKSHEET (AMW)

AMW Number	Work Package No./Procedure	Date	Page 3 of 6
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H. What methods have been planned to control the spread of contamination (water spray, fixative, ventilation, etc.) and can the areas be decontaminated to reduce risk?

- The area around each Breather Filter Assembly will be covered with a ground cover
- All existing breather filter components will be bagged as they are removed and disposed of.
- Since the entire B Farm complex is a VCZ, this work will be performed in SCBA.
  - Donning/doffing of respiratory protection may be required in a CA/HCA. If so, provisions of TFC-ESHQ-RP_RWP-C-03 section 4.3.5 will be followed
  - The minimum respiratory requirement for radiation protection is an APR with a particulate filter.
- Any standing water inside the filter housing will be drained into a bag containing at least twice the amount of absorbent needed to absorb the expected amount of liquid (~1 quart).
- The inside of the open riser will be controlled as a HCA. The area will be controlled as a HRA until survey results prove otherwise.
  - Should a HRA occur, the contingency plans in the Work Document will be followed
- General area contamination levels outside the breather filter assembly $\geq$50,000 dpm/100cm^2 Beta-Gamma or $\geq$70 dpm/ 100cm^2 Alpha will be decontaminated to below these levels.

I. Are the radiological control levels of multiple RWPs compatible?

- The major work is covered by one RWP; compatibility of the void limits, safe condition levels, or action levels of multiple RWPs is not an issue. RWP COF-029 provides radiological requirements and guidance for the work package work activities.

J. Can exposure/contamination levels be reduced by flushing lines or reducing radiation sources?

- The radiation levels on the breather filter assemblies are low enough to preclude the need for flushing or source reduction

K. What phases of the work can be moved to an area with lower exposure levels, prefabricated, or performed as shop work?

- The new radial filter assemblies will be assembled outside of the farm.

L. Describe the lessons learned that were reviewed and incorporated into the work packages.

- **IB-06-008** - Equipment Installed with Shipping Material Interferences
  - **Control**– Step incorporated into Work Package to ensure all new equipment is free of shipping material interferences prior to being transported to the farm.

M. What existing material, tools, or equipment currently at the job location can be used to complete the job (contaminated materials or tools) and what items or special tools must be staged?

- There currently are no existing materials, tools or equipment at the job location that can be used to complete this job.
- The FWS will ensure that all necessary materials, tools, and equipment needed to complete this job will be brought to the job location.

N. Where are the radiological control hold points, second party and independent verifications included in the technical work document and why?

- There are no hold points, second party or independent verifications in this work package.

ALARA MANAGEMENT WORKSHEET (AMW)

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O. Can dry-runs or walkdowns be utilized to improve process?

- A table-top walkdown was performed as part of the planning process to identify specific methods of performing this work.
- No dry runs or further walkdowns are necessary.

P. Have emergency and abnormal procedures/plans been reviewed?

- During the planning process, various potential emergency and abnormal conditions were discussed. Credible situations and the mitigating actions are included in the work document.

Q. Are success criteria and contingency plans identified?

- Success criteria:
  - No tank waste or liquid will be spilled.
  - The work is completed without injury.
  - The work is completed within the Individual & Collective Exposure Estimates.
  - The work is completed without a loss of contamination control or the generation of airborne radioactivity ≥0.2 DAC outside of a posted ARA.
  - The work is completed without a personal or clothing contamination event.
  - The work is completed within the scheduled time frame.
- Contingency Plans:
  - Contingencies for Safe Condition Levels and Action Levels are identified in RWP CO-467 and in the technical work document.

PART III METHODS OF DETERMINING

A. Airborne:

- Work place grab air sampling will be performed when the removing/replacing filter components.
- Lapel air sampling will be performed for a representative amount of personnel wearing respiratory protection for radiological purposes.

B. Dose Rate:

- Survey COF-006551 indicates the area around each breather filter is <0.5 mrem/hr

C. Contamination Level:

- Survey COF-006551 indicates the area around each filter is < 1000 dpm/100cm^2 Beta-Gamma and <20 dpm/ 100cm^2 Alpha.

D. Containment Needs:

- Due to the low contamination in the area of the breather filter assemblies, and the fact that nothing will be removed from the tanks during these evolutions, no containment will be required. Ground cover will be sufficient containment.

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ALARA MANAGEMENT WORKSHEET (AMW)

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E. Other:

- Bioassay for this work activity is required by RPP-27854, "Closure Operations Facility Source Term report". This includes a ten minute whole body count. Pu urinalysis, Sr urinalysis, and a chest count for personnel performing hands-on work with contaminated components. Personnel performing hands on work with contaminated components shall ACE in with the appropriate GW or WW Role and COBIO Role.

PART IV DATA RELIABILITY

CRITERIA	YES	NO	UNKNOWN
A. Is there reliable radiological survey data from the same location (e.g., pit, tank, piping, hood) for the same type of activity?	☐	☒	☐
Survey Report/Air Sample Number(s):			
B. Is there a pre-job or investigative survey from the area in question?	☒	☐	☐
Survey Report/Air Sample Number(s): COF-007316			
C. Is there reliable TWINS data for the area/location in question?	☒	☐	☐
D. Is there documented process knowledge indicating that radiological conditions identified in A, B, and/or C above remain accurate to the planned task?	☒	☐	▨
E. Has the schedule been reviewed to ensure that additional planned scopes of work will not adversely change the radiological conditions in the work area prior to performing this task?	☒	☐	▨
Schedule Review Date: 04/30/2008			

Instructions: If questions A, B, or C are answered YES, this job may proceed as planned. Questions D and E must be answered YES or the job must be planned using High risk assumptions.

COPY

PART V AMW REVIEWS AND APPROVALS

Print and Sign	
AMW Preparer	Date
S.B. Holcomb [illegible]	5/28/08
Field Work Supervisor	Date
KA [illegible]	5/28/08
Facility/Project RadCon Director	Date
F.B. [illegible] [illegible]	5/28/08
Facility/Project Operations Director	Date
B.P. Tucker [illegible]	5/28/08
AJRG Chairperson (high risk)	Date
N/A	

ALARA MANAGEMENT WORKSHEET (AMW)

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PART VI EMPLOYEES INVOLVED IN AMW DEVELOPMENT

	Al Hjellum	Planner			
	Mark Johnson	FWS			
	K. Willoughby	QC			
	D.L. Merrill	IH			
	S.B. Holcomb	Rad Con SME			
	J. Lochridge	NCO			

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ATTACHMENT B

Donning/Doffing Respiratory Protection in Contamination/High Contamination Areas

1. a. Establish areas for staging of respirator(s) in a suitable location. These areas must:

   - Be located in a low background radiation area [<150 cpm beta-gamma (and < 3 cpm alpha where applicable)]
   - Have a low potential for changing radiological conditions.

   b. Ensure that steps are taken to prevent the respirators from becoming contaminated prior to use by:

   - Transporting and storing respirators inside unopened, sealed plastic bags
   - Keeping respirators inside of other sealed containers until needed for use.

   c. Ensure a contamination survey of the respiratory protection staging area is performed before use, after each use, and at the end of the job.

   d. Remove at least the outer pair of gloves as directed by radiological control personnel.

   e. Receive a survey of hands, forearms, and face from a health physics technician prior to donning respirators.

2. Establish areas for doffing respiratory protection while inside a Contamination/High Contamination Area:

   - Be located in a low background radiation area [<150 cpm beta-gamma (and < 3 cpm alpha where applicable)]
   - Have a low potential for changing radiological conditions.
   - Remove at least the outer pair of gloves as directed by radiological control personnel.
   - Receive a survey of hands, forearms, and respirator from a health physics technician prior to removing respirators.

DOFFING DURING ATTACH B

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Equipment Installed with Shipping Material Interferences

Bulletin Date: Mar 23 2006 12:00AM

Bulletin Number: IB-06-008

Lessons Learned Statement: Equipment installed without removing shipping materials caused interference with the intended design.

Discussion of Activities: During maintenance activities, drain lines were discovered to be taped over in boxes installed to house C-200 tank Articulating Mast Systems. The drain holes had been taped over either as a cleanliness measure prior to installation or to eliminate vapors in the box during vacuum line tie-in. Similarly, a ring holding the adjustable weight system for the C-103 vacuum controller system was discovered to be taped to its housing. The ring had been taped to prevent it from moving during shipment and the tape was not removed following installation.

Analysis: Although failure of other barriers or simultaneous abnormal conditions would have had to occur to cause equipment problems, failure to inspect the new systems for shipping materials following installation could have contributed to operational problems. Neither instance had Authorization Basis implications.

Recommended Actions: Inspect newly installed equipment and components for the presence of shipping materials prior to operation.

References: PER-2005-4109, PER-2005-3769

Originator: David Saueressig, 373-0183

Key words: AMS, Ventilation, Shipping Material

Distribution: All CH2M HILL Managers, Operations

LL
IB-06-008

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IGNITION SOURCE CONTROL REQUIREMENTS SCREENING

Work Document Number:	CLO-WO-08-0796 B-103, 105+203		
Prepared By:	Greg Gauck.		
Signature:		Date:	5.22.08
Responsible Engineer Approval Signature:	Greg Gauck	Date:	5.22.08

SECTION I. IGNITION SOURCE CONTROL REQUIREMENT APPLICABILITY

1 **Does the activity or operation apply inside WASTE-INTRUDING EQUIPMENT as defined in HNF-SD-WM-TSR-006?**

Yes ○ No ◉ If "Yes", Ignition Source Control Set 1 applies.

2 **Does the activity or operation apply to the headspace of a Waste Group A DST or connected enclosed space directly above a Waste Group A DST?**

Yes ○ No ◉ If "Yes", Ignition Source Control Set 2 applies.

3 **Does the activity or operation apply to the headspace of a Waste Group B DST during mixer pump operation or air lift circulator operation?**

Yes ○ No ◉ If "Yes", Ignition Source Control Set 2 applies.

4 **Does the activity or operation apply to the headspace or connected enclosed space of an Inactive Tank that could have a spontaneous gas release event resulting in headspace flammable gas concentration ≥ 100% of the LFL?**

Yes ○ No ◉ If "Yes", Ignition Source Control Set 2 applies.

5 **Does the activity or operation apply to the headspace or connected enclosed space of an Inactive Tank where flammable gas concentration controls are not applied and the headspace flammable gas concentration can reach ≥ 100% of the LFL?**

Yes ○ No ◉ If "Yes", Ignition Source Control Set 2 applies.

6 **Does the activity or operation apply inside SST Vacuum Retrieval System equipment, including the slurry tank and water separator, which can be exposed to waste?**

Yes ○ No ◉ If "Yes", Ignition Source Control Set 2 applies.

SECTION II. IGNITION SOURCE CONTROL REQUIREMENT COMPLIANCE

If the response to any item in Section I is "Yes", this section must be completed for affected operations and activities.

If the responses in Section I are "No", the screening is complete without filling in this section.

7 **Document the ignition source control requirements that apply and the affected activities, materials, and equipment on an Ignition Source Control Evaluation Worksheet (A-6003-749).**

8 **Do the activities, materials, and equipment comply with the ignition source control requirements?** FGEAB reviews of activities, materials, and equipment are documented in TFC-ENG-STD-13.

Yes ○ No ○ [redacted]

9 **Do the activities, materials, and equipment provide equivalent safety per the FGEAB?** FGEAB reviews of activities, materials, and equipment are documented in TFC-ENG-STD-13.

Yes ○ No ○ Not Applicable ○ [redacted]

10 **If not all activities, materials, and equipment are addressed, is there an ORP-approved Safety Basis for this activity or operation that provides alternative ignition control requirements to address the flammable gas hazards?**

Yes ○ **Specify:**

Does this approved basis clearly apply to the affected facilities?

Yes ○ The activity or operation may proceed.

No ○ **The activity or operation is not permitted by the TSRs and ORP approval must be sought.** Follow procedure in TFC-ENG-SB-C-01 to prepare and submit a Safety Basis amendment.

No ○

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Job/Task No.: B Farm Radial Filters

WORKSITE HAZARD ANALYSIS

Date: 6-2-08

Hazards	Possible Controls
☐ Electrical	☐ Lock out/Tag out ☐ Barricade ☐ Electrical Energized Work Permit ☐ PPE Category (-1 to 4) specify ____ ☐ AED Location Known/Available
☒ Crane or other Lifting Equipment Lifting and rigging objects	☐ Special/Critical Lift Permit ☒ Signalman assigned ☒ Lifting equip inspected ☒ Area around crane barricaded ☒ Spotter
☒ Vehicular Traffic and/or Heavy Equipment	☐ Traffic Barricades ☐ Cones ☐ Signs ☒ Flagman ☒ Lane closure ☐ Communication with equipment operator ☐ Surface condition
☐ Overhead Utilities	☐ De-energization req. ☐ Insulation blankets req. ☐ Wire watcher req. ☐ Req. clearance distance ☐ Safe work zone marked
☐ Falls (Scaffolding, Ariel lifts, Ladders, Roof work)	☐ Inspect general ladder condition before use ☐ Current Ladder inspections ☐ Ladder tied off ☐ Proper angle/placement of ladders ☐ Proper ladder size ☐ 100% Tie Off of tools from lifts/scaffolds ☐ Scaffold User Inspection before use ☐ Competent Person Inspection of Scaffold ☐ Fall Protection Plan ☐ Roof Assessment
☐ Moving/Falling objects from height	☐ Tether small objects ☐ Use rope, canvas bag ☐ Barricade around potential fall area ☐ Barricade tape ☐ Hard hats ☐ Tie off tools/materials ☐ Warning signs ☐ Cover over opening ☐ Rigid railing required
☐ Excavations	☐ Excavation/Shoring Permit ☐ Inspect prior to entering ☐ Competent Person Inspection ☐ Proper sloping/shoring ☐ Access/egress provided ☐ Scans ☐ Barricades
☐ Underground Utilities (Line Locating)	☐ Reviewed ground scans ☐ Received excavation permit ☐ Maintain clearance distance ☐ Safe work zone marked ☐ Instulated hand tools
☐ Fire Hazard, weld, burn, grind, solder	☐ Fire Extinguishers ☐ Fire Watch ☐ Respiratory Protection ☐ Adjacent area protected ☐ Unnecessary flammable material removed ☐ Hot Work Permit ☐ Fire Marshall Permit
☒ Noise > 85 dBA	☐ Hearing protection ☐ Noise monitoring (IH) Behind Crane
☐ High Energy Air/Steam/ Fluid > 500 PSI or > 200 degrees	☐ Depressurize ☐ PPE ☐ Whip Check Tie-downs ☐ Cool down systems ☐ Lock Out/Tag Out
☐ Stored Energy	☐ Lock Out/Tag Out ☐ Remove energy ☐ PPE
☒ Rotating/Moving Equipment or Pinch points	☐ Lock Out/Tag Out ☐ Machine guards in place ☐ Block parts against motion ☐ PPE ☒ Hand/Body position ☐ Remove Loose clothing

Applicable PPE

- ☐ Hard Hat
- ☒ Eye/Face Protection
  - ☐ Safety Glasses and side shields
  - ☐ Face Shield
  - ☐ Face Shield ARC
  - ☐ Chemical Goggles
  - ☐ Welding Hood
  - ☒ Other: Respiratory PPE
- ☐ Hearing Protection
  - ☐ Ear Muffs
  - ☐ Specify type: ____
  - ☒ Foam/Ear Plugs When behind crane for long periods of time
- ☒ Gloves
  - ☒ Silver Shield B-105
  - ☐ Canvas
  - ☐ Latex
  - ☐ Nitrile
  - ☐ PVC
  - ☐ Neoprene
  - ☐ Chemical Resistant Gloves
  - ☒ Specify: See RWP IS-6
  - ☐ Insulated Gloves
  - ☐ Vibration Dampening
  - ☒ Leather Gloves
  - ☐ Rubber Gloves
  - ☐ Voltage Rated Gloves NFPA-70
  - ☐ Other: ____
- ☒ Foot Protection
  - ☒ Protective footwear w/ankle support
  - ☐ Substantial footwear
  - ☐ Rubber Boots
  - ☐ Rubber Boots cover
  - ☐ Dielectric Footwear
  - ☐ Chemical Resistant Footwear
  - ☐ Other: ____

Job/Task No.: B Farm Radial Filters

WORKSITE HAZARD ANALYSIS (continued)

Date: 6-2-08

Hazards (continued)	Possible Controls (continued)
☐ Working With Chemicals (Examples: Lead, Beryllium, Asbestos, Acids, Bases, Paints, Glues, Solvents)	☐ Obtain MSDS and review controls ☐ Have proper containers & labels ☐ PPE ☐ Fume Hoods, Glove boxes, etc. ☐ Safety Showers identified ☐ Eye wash station ☐ Asbestos Work Permit ☐ IH Monitoring Plan # _____ ☐ Ventilation/Engineering Control
☐ Laboratory Hazards ☐ Chemical Splashes ☐ Chemical Compatibility ☐ Reactive ☐ Time Sensitive	☐ PPE ☐ Chemical Segregation ☐ Volume limitations ☐ Special Labeling or postings ☐ Fume Hoods
☐ Pressurized Gas Cylinders	☐ Caps on while moving ☐ Secured while moving or stored ☐ Suitable lifting moving device
☒ Potential Contact with Tank Waste	☒ Silver shield PPE (Gloves, hood, apron) ☐ Respiratory protection B-105
☐ Confined Space	☐ Confined Space permit
☐ Wall/Ceiling Penetration	☐ Scanned area where penetration will take place ☐ Perform Walk Around
☒ Radiological ☒ Radiological Material ☒ Radiological exposure ☒ Radiological contamination ☒ Loose or airborne contamination ☐ Fixed contamination disturbed ☐ Radiological generating device ☒ Radiological system breached	☒ Radiological Work Permit # COF-029 Rev 1 ☐ Radiological Screening process ☒ ALARA Management Worksheet ☐ Minimize **Time** in area (use of mockups, automated systems, etc.) ☐ Maximize **Distance** to source of radiation (extension tools, remote operated equip., etc.) ☐ Use of **Shielding** ☐ Reduce item generating concern (contamination or radiation source) ☒ Respiratory Protection ☐ Contain source of contamination concern ☒ Apply approved fixative
☐ Flammable Gases	☐ Bonding ☐ Intrinsically safe tools/equipment
☐ Temperature Extremes ☐ Heat Stress ☐ Cold Stress	☐ Use Heat Stress Mitigation Checklist ☐ Warming Hut ☐ Frequency of Breaks
☒ Tank Farm Vapors	☒ IH Monitoring and Sampling Plan # See "Other" ☐ Temp. VCZ
☐ Lack of Adequate Lighting	☐ Change work to daytime ☐ Temporary lighting (Light stand or flashlight, etc.)
☐ Ergonomic (Examples: Lifting, Pushing/ Pulling, Force Impact, Awkward Positions, Vibration)	☐ 2 Person Lift ☐ Mechanical Lift ☐ Stool/Adjust Work Height ☐ Material Handling Cart/Dolly ☐ Powered Tools ☐ Anti-Fatigue Mat ☐ Reach Tools ☐ Worker Rotation ☐ Other Per IH _____

Applicable PPE (continued)

- ☒ Respiratory Protection
  - ☐ APR
  - ☐ PAPR
  - ☐ Airline
  - ☒ SCBA
  - ☒ Carri-Air
  - ☒ Specify Cartridges: See Other
- ☐ Special Clothing
  - ☐ Tyvek
  - ☐ NFPA-70 Rated
  - ☐ Nomex III
  - ☐ Rain Suit
  - ☐ Safety Vest
  - ☐ Silver Shield Apron, etc.
  - ☐ Other: _____
- ☐ Knee Pads

Job/Task No.: B Farm Radial Filters

WORKSITE HAZARD ANALYSIS (continued)

Date: 6-2-08

Other:

Nuclear Safety and Licensing had evaluated this work against MD-059. It does not constitute a critical lift.

B Farm is posted as a VCZ at the farm boundary.

Respiratory protection is specified in Tank Farm Chemical Exposure Hazard Analysis 0508-364 as FULL FACE APR WITH GME-P100 CARTRIDES. ← Not Using this plan due to Stop Work.

Silvershield PPE is required for those people that will come in contact with condensate at B-105. B-105 is NOT on the Table 1 list of Tanks "not requiring silvershield PPE".

B-103 and B-203 ARE on Table 1 list of Tanks "not requiring silvershield PPE".

The IHT will conduct air sampling and monitoring per 7X100-JWJ-07-036 Industrial Hygiene Monitoring and Sampling Plan for B Complex Tank Farm Work Activities.

SAFETY IS NO ACCIDENT

PRE-JOB BRIEFING

Job Description/Title: B103, B105 1B-70 Install Radial Filter

Date: 6-5-8

Work Order No.: CLO-WO-98-0795

Supervisor: Pat Howard

Place a check mark in all that apply

* Use as applicable for General Pre-Job Briefings

\# Required for medium or high radiological risk work activities

Define the Work

- ☐ #*Work Scope
- ☐ *Purpose and nature of work
- ☐ #*Tasks and Critical Tasks
- ☐ *Tasks assignments
- ☐ *Procedural or Work Instruction Adherence/Use
- ☐ #*Roles and Responsibilities
- ☐ *Special qualifications or training
- ☐ Handoffs
- ☐ Controlling Authority
- ☐ Outside Resources Required
- ☐ _____

Hazards and Controls

- ☐ #*Review the Worksite Hazard Analysis (WHA)
- ☐ #*Discuss the controls and PPE identified in the WHA
- ☐ *Discuss the precautions in the work instructions
- ☐ *Discuss any warnings or cautions listed in the work instruction or procedure
- ☐ *Error Likely situations
- ☐ Discuss contingency plans
- ☐ #*Discuss the permits and their controls
- ☐ #*Discuss any ALARA aspects of the work
- ☐ Discuss Voluntary Use of Respirators
- ☐ Discuss engineered or administrative controls for Radiological Containments
- ☐ _____

Prerequisites

- ☐ #*Review the prerequisites listed in work instructions or procedures
- ☐ Review Communication requirements (What, Who, When) (Three-Way Communications)
- ☐ Tools, Materials, or Equipment required to be staged
- ☐ *Technical Specification Requirements (TSRs)
- ☐ *Limiting Condition for Operations (LCOs)
- ☐ *Valve Manipulation Walkdowns (see Pre-Job Briefing procedure)
- ☐ Oversight Requirements (Senior Supervisory Watch)
- ☐ _____

Special Requirements or Unusual Conditions

- ☐ #*Interface with other organizations
- ☐ *Potential Communication obstacles
- ☐ #*Other Work in the Area
- ☐ Changes in Scope or Work Conditions
- ☐ #*Procedure questions or errors
- ☐ Equipment line-up/configuration
- ☐ #Hold Points, and who is responsible to complete
- ☐ _____

Lockout Tag-out Requirements

- ☐ *Review Tagout Authorization and Tags
- ☐ Identify affected employees
- ☐ *Identify Authorized workers
- ☐ Identify Primary Authorized worker (if used)
- ☐ *Authorized Worker Lock and Tag
- ☐ *Personal Locking Devices
- ☐ _____

Abnormal Events

- ☐ #*Emergency Response
- ☐ *Alarm Response
- ☐ Location of Nearest:
  - o Spill Kit
  - o Operable Safety Shower
  - o Operable Decontamination facility
  - o Event response equipment, supplies, personnel
- ☐ *Roles and Responsibilities for Injury, Spills, etc.
- ☐ *Lessons Learned
- ☐ _____

Post Work Activities

- ☐ #*House Keeping/Final Cleanup
- ☐ *Post Maintenance Testing
- ☐ Post Job Reviews/Debriefs
- ☐ Post Job ALARA review
- ☐ _____

Comments

N/A

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Supervisor signature and date indicates that all personnel have been briefed on the areas indicated by a check mark.

Supervisor Signature: PMHOWARD _____ Date: 6-5-8

CH2M HILL
ATTENDANCE ROSTER

Subject: B-103 + 105 Radial Filter Install

Date: 6/5/08

Leader: PM Howard

NAME (Print)	Signature	Position/Title	Organization
PM Howard	PM Howard	FWS	BO
M.R. CHUNN	M R C[illegible]	NCO	BO
J. LOCHRIDGE	[illegible]	NCO	BO
J D Shupe	[illegible]	N[illegible]	BO WRPS
SR JOSEPH	[illegible]	NCO	CO
[illegible]	[illegible]	ENG	BO.
Kim JONES	[illegible]	HPT	BO
William Sullivan	[illegible]	IHT	BO
Vince Eilertsen	[illegible]	IHT	BO
MT WOODCOCK	MT Woodcock	IHT	BO
Kirk Higbee	Kirk Higbee	IHT	BO
Albert De la Paz	Albert De la Paz	m/w	BO
Jerry E. Ferson	Jerry E. Ferson	Maint.	BO
K. WILLOUGHBY	K. Willoughby	QC	BO/CHG
A JOHNSON	[illegible]	HPT	BO
CD CAREAGA	CD Careaga	HPT	BO
B Moore	B Moore	[illegible]	CHG
Judy	[illegible]	HPT	BO
CHARLIE SCHERE	[illegible]	SM	FH
STEVE WADE	Steve Wade	SM	FH
[illegible] NOLAND	[illegible]	HPT	HPT
T [illegible]	[illegible]	[illegible]	BO

54

SAFETY IS NO ACCIDENT

PRE-JOB BRIEFING

Job Description/Title: B Farm Radial fitters

Date: 6-4-08

Work Order No.: CLO-HO-08-0796

Supervisor: MN Johnson

Place a check mark in all that apply

* Use as applicable for General Pre-Job Briefings

Required for medium or high radiological risk work activities

Define the Work

- [X] #*Work Scope
- [ ] *Purpose and nature of work
- [X] #*Tasks and Critical Tasks
- [ ] *Tasks assignments
- [X] *Procedural or Work Instruction Adherence/Use
- [X] #*Roles and Responsibilities
- [ ] *Special qualifications or training
- [ ] Handoffs
- [ ] Controlling Authority
- [ ] Outside Resources Required
- [ ] _____

Hazards and Controls

- [X] #*Review the Worksite Hazard Analysis (WHA)
- [X] #*Discuss the controls and PPE identified in the WHA
- [ ] *Discuss the precautions in the work instructions
- [ ] *Discuss any warnings or cautions listed in the work instruction or procedure
- [ ] *Error Likely situations
- [ ] Discuss contingency plans
- [X] #*Discuss the permits and their controls
- [X] #*Discuss any ALARA aspects of the work
- [ ] Discuss Voluntary Use of Respirators
- [ ] Discuss engineered or administrative controls for Radiological Containments
- [ ] _____

Prerequisites

- [X] #*Review the prerequisites listed in work instructions or procedures
- [ ] Review Communication requirements (What, Who, When) (Three-Way Communications)
- [X] Tools, Materials, or Equipment required to be staged
- [ ] *Technical Specification Requirements (TSRs)
- [ ] *Limiting Condition for Operations (LCOs)
- [ ] *Valve Manipulation Walkdowns (see Pre-Job Briefing procedure)
- [ ] Oversight Requirements (Senior Supervisory Watch)
- [ ] _____

Special Requirements or Unusual Conditions

- [X] #*Interface with other organizations
- [ ] *Potential Communication obstacles
- [ ] #*Other Work in the Area
- [ ] Changes in Scope or Work Conditions
- [ ] #*Procedure questions or errors
- [ ] Equipment line-up/configuration
- [ ] #Hold Points, and who is responsible to complete
- [ ] _____

Lockout Tag-out Requirements

- [ ] *Review Tagout Authorization and Tags
- [ ] Identify affected employees
- [ ] *Identify Authorized workers
- [ ] Identify Primary Authorized worker (if used)
- [ ] *Authorized Worker Lock and Tag
- [ ] *Personal Locking Devices
- [ ] _____

Abnormal Events

- [X] #*Emergency Response
- [ ] *Alarm Response
- [X] Location of Nearest:
  - Spill Kit
  - Operable Safety Shower
  - Operable Decontamination facility
  - Event response equipment, supplies, personnel
- [X] *Roles and Responsibilities for Injury, Spills, etc.
- [ ] *Lessons Learned
- [ ] _____

Post Work Activities

- [X] #*House Keeping/Final Cleanup
- [ ] *Post Maintenance Testing
- [ ] Post Job Reviews/Debriefs
- [ ] Post Job ALARA review
- [ ] _____

Comments

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Supervisor signature and date indicates that all personnel have been briefed on the areas indicated by a check mark.

Supervisor Signature _____ Date 6-4-08

CH2M HILL
ATTENDANCE ROSTER

Subject: B Firm Refinals

Date: 6-4-08

Leader: MN Johnson

NAME (Print)	Signature	Position/Title	Organization
Robert Bowe		NCO	CHG
J D Shupe		NCO	CHG/WRPS
R Joseph		NCO	CO
D W Butterball		FCO	FH
Ron Frink		EAC REP	ORP
Ryan B Martin		ELEC	BO
M Woodcock		IHT	BO
Darin Judy		RCT	BO
Greg Couch		Eng	BO
Charlie Schorr		Sheetmetal	FH
Steve Wade		SM	FH
Jim Lochridge		NCO	CHG/BO
Bill Samson		NCO	BO

5p

CH2M HILL
ATTENDANCE ROSTER

Subject: B Farm Rabbit

Date: 6-4-08

Leader: MN Johnson

NAME (Print)	Signature	Position/Title	Organization
B.D. Windsor Jr	BD	NCO	BOO
H Brown	HB	NCO	BO
B Moore	Bill Moore	FA	CH2
H M Brown	Henry M Brown	DRIVER	CLEAR.
Steve Stamper		NCO	BO
L. Grace		NCO	BO
K. Willoughby	K. Willoughby	QC	BO/CH2
KR Higbee	Kirk Higbee	IHT	BO
Vince ~~Valentine~~		IHT	BO
William Sullivan		IHT	BO
Jerry F Ferson	Jerry F Ferson	Maint.	BO
Albert De La Paz	Albert De La Paz	M/W	BO
Ed Cervantes	Eduardo Cervantes	M/W	BO
A Johnson		HPT	BO
V Shawver		HPT	BO
Kim Jones		HPT	BO
KA Bord		FWS	BO
CW PEOPLES	CW Peoples	FWS	BO
CJ CARRASCO	CJ Carrasco	HPT	BO

57

CH2M HILL
ATTENDANCE ROSTER

Subject: B Farm radial Fitters

Date: 6/3/08

Leader: MN Johnson

NAME (Print)	Signature	Position/Title	Organization
Judy	[signature]	RCT	RADCON
CHARLIE SCHEER	[signature]	SHEETMETAL	FH
K. WILLOUGHBY	[signature]	QC	QA/CHG
STEVE WADE	Steve Wade	SM	FH
Jerry Ferson	Jerry E. Ferson	Fitter	BO
Ed Cervantes	[signature]	m/w	BO
Albert De la Paz	Albert De la Paz	m/w	BO
B Moore	B Moore	JM	C+R
DW Hutteball	[signature]	I MONKEY	C&R
Kurt Obermeyer	Kurt Obermeyer	Iron/worker	C&R
PAT Henderson	[signature]	IW	C&R
J.S. Clancy	J.S. Clancy	C/O	C&R
H M Brown	Henry M Brown	DRIVER	C&R
Shelly Doss	Shelly Doss	ENV.	BO
Vivian Wyant	Vivian Wyant	HPT	Radcon
Bill Samson	Bill Samson	NCO	BO
N Brown	[signature]	NCO	BO
T. Kenworthy	[signature]	NCO	B.
Kim Jones	Kim Jones	HPT	BO

58

A-6003-211 (11/05)

CH2M HILL
ATTENDANCE ROSTER

Subject:	Date:
	Leader:

NAME (Print)	Signature	Position/Title	Organization
MT Woodcock	MT Woodcock	IHT	BO
Vince Eilertsen	Vince Eilertsen	IHT	BO
William Sullivan	William Sullivan	IHT	BO
Kirk Higbee	Kirk Higbee	IHT	BO

59

SAFETY IS NO ACCIDENT

PRE-JOB BRIEFING

Description/Title: Install radial filters at B-203, 103 and 105

Date: 6-2-08

Work Order No.: CLO-WO-08-716

Supervisor: MN Johnson

Place a check mark in all that apply

* Use as applicable for General Pre-Job Briefings

Required for medium or high radiological risk work activities

Define the Work

- [X] #*Work Scope
- [X] *Purpose and nature of work
- [X] #*Tasks and Critical Tasks
- [ ] *Tasks assignments
- [ ] *Procedural or Work Instruction Adherence/Use
- [X] #*Roles and Responsibilities
- [ ] *Special qualifications or training
- [ ] Handoffs
- [ ] Controlling Authority
- [ ] Outside Resources Required
- [ ] _____

Hazards and Controls

- [X] #*Review the Worksite Hazard Analysis (WHA)
- [X] #*Discuss the controls and PPE identified in the WHA
- [ ] *Discuss the precautions in the work instructions
- [ ] *Discuss any warnings or cautions listed in the work instruction or procedure
- *Error Likely situations
- [ ] Discuss contingency plans
- [X] #*Discuss the permits and their controls
- [X] #*Discuss any ALARA aspects of the work
- [ ] Discuss Voluntary Use of Respirators
- [ ] Discuss engineered or administrative controls for Radiological Containments
- [ ] _____

Prerequisites

- [X] #*Review the prerequisites listed in work instructions or procedures
- [ ] Review Communication requirements (What, Who, When) (Three-Way Communications)
- [X] Tools, Materials, or Equipment required to be staged
- [ ] *Technical Specification Requirements (TSRs)
- [ ] *Limiting Condition for Operations (LCOs)
- [ ] *Valve Manipulation Walkdowns (see Pre-Job Briefing procedure)
- [ ] Oversight Requirements (Senior Supervisory Watch)
- [ ] _____

Special Requirements or Unusual Conditions

- [ ] #*Interface with other organizations
- [ ] *Potential Communication obstacles
- [ ] #*Other Work in the Area
- [ ] Changes in Scope or Work Conditions
- [X] #*Procedure questions or errors
- [ ] Equipment line-up/configuration
- [ ] #Hold Points, and who is responsible to complete
- [ ] _____

Lockout Tag-out Requirements

- [ ] *Review Tagout Authorization and Tags
- [ ] Identify affected employees
- [ ] *Identify Authorized workers
- [ ] Identify Primary Authorized worker (if used)
- [ ] *Authorized Worker Lock and Tag
- [ ] *Personal Locking Devices
- [ ] _____

Abnormal Events

- [X] #*Emergency Response
- [ ] *Alarm Response
- [X] Location of Nearest:
  - Spill Kit
  - Operable Safety Shower
  - Operable Decontamination facility
  - Event response equipment, supplies, personnel
- [X] *Roles and Responsibilities for Injury, Spills, etc.
- [ ] *Lessons Learned
- [ ] _____

Post Work Activities

- [X] #*House Keeping/Final Cleanup
- [ ] *Post Maintenance Testing
- [ ] Post Job Reviews/Debriefs
- [ ] Post Job ALARA review
- [ ] _____

Comments

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Supervisor signature and date indicates that all personnel have been briefed on the areas indicated by a check mark.

Supervisor Signature _____ Date 6-2-08

CH2M HILL
ATTENDANCE ROSTER

Project:	Date: 6-2-08
Install radial filters B233, 103, 105	Leader: MN Johnson

NAME (Print)	Signature	Position/Title	Organization
T. Kenworthy		NCO	CO
M.R. CHUNN	M R Ch	NCO	BO
B.D. Windsor Jr	B D W	NCO	BO6
N Brown		NCO	130
Bill Samson	Bill Samson	NCO	BO
L. Mancher	L. Mancher	NCO	[illegible]
R. Eadie	R. Eadie	Driver	FH
P Henderson	P H	IW	FH.
Gale L. Buck	Gale L. Buck	IW	FH
DARIN Seay		RCT	BO
STEVE WADE	Steve Wade	SM	FH
Jerry E Ferson	Jerry E Ferson	Fitter	BO
J.S. Clancy	J.S. Clancy	CIO	F.H.

A-6003-211 (11/05)

CH2M HILL
ATTENDANCE ROSTER

Subject: Install radial filters B203, K03, K05

Date: 6-2-08

Leader: MN Johnson

NAME (Print)	Signature	Position/Title	Organization
MT WOODCOCK	[signature]	IHT	BO
William J Sullivan	[signature]	IHT	BO
Vince Eilertsen	[signature]	IHT	BO
Kirk Higbee	Kirk Higbee	IHT	BO
DOUG EDWARDS	Doug Edwards	HPT	BO
Carl Schroeder	[signature]	HPT	BO
Albert De La Paz	Albert De La Paz	m/w	BO
Edwardo Cervantes	Edwardo Cervantes	[illegible]	BO
SK Bolt	SK Bolt	Elect	BO
K. WILLOUGHBY	[signature]	QC	BO/CHG
KE NORRIS	[signature]	Crane OP	FH
B Moore	B Moore	[illegible]	FH
HENRY C. SCHEER	Henry Scheer	SHEETMETAL	FH

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A-6002-311 (11/05)

TANK FARM CHEMICAL EXPOSURE HAZARD ANALYSIS
B-Farm Replace Breather Filters
May 28, 2008

0508-364

Summary:

This hazard assessment has been conducted to review the Vapor Control Zone (VCZ) requirements for non-intrusive tank/tank system work within B-Farm to support CLO-WO-08-0796, 241-B-103, B-105, and B-203, Replace G-1 Breather Filters with New Radial Filters. The entire farm is currently posted as a VCZ requiring supplied air. Based upon this hazard assessment as per TFC-ESHQ-S_IH-CD-48, Managing Vapor Control Zones, the B-Farm VCZ controls can be modified at the affected work area associated with CLO-WO-08-0796, 241-B-103, B-105, and B-203, Replace G-1 Breather Filters with New Radial Filters.

Work Activity/Task:

1. The work activities are specified in CLO-WO-08-0796, 241-B-103, B-105, and B-203, Replace G-1 Breather Filters with New Radial Filters.
2. The work activities do not require waste-disturbing activities.

Comparable Activities:

1. Personal air sampling during work in B-Farm showed no exposure measurements approaching 10% of the occupational exposure limits (OELs) of Tank Farm Chemicals of Potential Concern (COPCs), reported in 7X100-JWJ-07-011, Results of Personal Air Sampling Conducted in B/T/U Tank Farms from May 2004 - December 2006.
2. Further review of personal air sampling for work around B-Farm vapor sources showed no exposure measurements approaching 10% of the OELs of Tank Farm COPCs from May 2006-May 2007 (Table 1).
3. Direct reading monitoring for ammonia and volatile organic compounds conducted on 3/22/07 during repair of the B-202 ENRAF (DRI # 07-00702) showed no detectable airborne concentrations of the chemicals.
4. This work activity is not waste disturbing.

Hazard Identification:

1. B-Farm vapor characterization has not been completed. The current list of Tank Farm COPCs (published on the Safety and Health Web Page) may be present in work areas.
2. Source air samples were collected as per 73D20-JWJ-08-075, Industrial Hygiene Sample Plan: B Farm Tanks Headspace Air Samples to evaluate worst case emissions to evaluate the current condition of the tank(s) gas and vapor environment. The air samples were analyzed for ammonia, volatile organic compounds (VOC), mercury vapor, formaldehyde, nitrous oxide and a gas chromatograph - mass spectrometor (GC-MS) scan:

    a. The source air samples results in Table 2 show that nitrous oxide and volatile organic compounds exceeded the Tank Farm action limit (TFAL) of 50 ppm and 25 ppm respectively in B-103 and B-105. The remaining source air samples did not show levels exceeding TFALs.

b. The mass spectrograph – gas chromatograph (MS-GC) scan did not show any unknown chemicals which would present a health hazard to workers performing this activity.

3. Personal air sampling during work in B-Farm showed no exposure measurements approaching 10% of the OELs of Tank Farm COPCs (7X100-JWJ-07-011, Results of Personal Air Sampling Conducted in B/T/U Tank Farms from May 2004 - December 2006).
4. Further review of personal air sampling for work around at B-Farm vapor sources showed no exposure measurements approaching 10% of OELs of the Tank Farm COPCs from May 2006- May 2008 (Table 1).

Data Review:

1. The source air samples results collected as per 73D20-JWJ-08-075, Industrial Hygiene Sample Plan: B Farm Tanks Headspace Air Samples showed that nitrous oxide and volatile organic compounds exceeded the Tank Farm action limit (TFAL) of 50 ppm and 25 ppm respectively in B-103 and B-105 (Table 2).
2. Personal air sampling during work in B-Farm showed no exposure measurements approaching 10% of the OELs of Tank Farm COPCs (7X100-JWJ-07-011, Results of Personal Air Sampling Conducted in B/T/U Tank Farms from May 2004 - December 2006).
3. Further review of personal air sampling for work around at B-Farm vapor sources showed no exposure measurements approaching 10% of OELs of the Tank Farm COPCs from May 2006- May 2008 (Table 1).
4. There is no TWINS vapor data on the affected B-Farm tanks collected in the last 10 years. Discussions with Process Engineering indicated there is no additional chemical information for these tanks than what is currently available.

Vapor Hazard Controls:

1. Full-face air purifying respirators with GME-P100 cartridges are prescribed for this work.
2. The IHT will conduct air monitoring in the active work area for nitrous oxide (N_2O) as per TFC-ESHQ-S_IH-D-32, REV A-2, MIRAN® 205B Series SAPPHIRE Instrument Operation. The IHT will collect a running 25 minute air sample into a 25 liter Tevlar sample bag with a SKC air sample pump @ 1 liter per minute. The Tevlar bag N_2O air samples will be analyzed with the Miran 205B in the B-Farm change trailer. The N_2O air samples will be collected and analyzed for the duration of the job.
3. The IHT will conduct air monitoring in the work area for ammonia as per TF-OPS-IHT-004, A-1, Preparation and Field Use of the iSP Motorized Sampling Pump and the iTX Multi-Gas Monitor.
4. The IHT will conduct air sampling and monitoring as per 7X100-JWJ-07-036, Industrial Hygiene Monitoring and Sampling Plan for B-Complex Work Activities.
5. If IHT monitoring detects ammonia concentrations exceeding the Tank Farm Chemical Action Limit of 12 ppm or N_2O exceeding 25 ppm in work area during the operation, the work will be paused and the workers placed in a safe configuration and the issue resolved before the work proceeds. If area ammonia or N_2O levels remain above their respective chemical action limits for 15 minutes, the air purifying respirator can no longer be used and supplied air will be required for the VCZ in B-Farm.

TANK FARM CHEMICAL EXPOSURE HAZARD ANALYSIS
B-Farm Replace Breather Filters
May 28, 2008

0508-364

Title:	Name:	Signature:	Date:	Phone:
Industrial Hygienist:	J.W. Jabara, CIH		5/28/08	373-1385
IH Reviewer:	D.L. Merrill, CIH		5/29/08	373-2605
IH Manager:	K.A. Roueche	Kim Roueche	5/29/08	372-3310
Operations Manager:	R. Cook	Randy W.M. Cook	5/29/08	372-1450

Table 1. Personal Air Samples collected in B-Farm From 05/01/2006 To 05/01/2008

Agent	COPC	Date Range	# Samples Taken	# Above Detection Limit	Highest Concentration	UOM	TWA OEL	OEL UOM
1,1 biphenyl	X	12/20/2006 - 05/29/2007	3	0	ND		0.2	ppm
1-Butanol	X	12/20/2006 - 05/29/2007	5	3	0.003	ppm	20	ppm
2, 4-Dimethylpyridine	X	12/20/2006 - 05/29/2007	5	0	ND		0.5	ppm
2,5-Dihydrofuran	X	12/20/2006 - 05/29/2007	5	0	ND		1	ppb
2-Hexanone	X	12/20/2006 - 05/29/2007	5	0	ND		5	ppm
3-Buten-2-one	X	12/20/2006 - 05/29/2007	5	1	0.0001	ppm	0.2	ppm
Acetaldehyde	X	02/23/2007 - 05/29/2007	3	2	0.005	ppm	25	ppm
Acetonitrile	X	12/20/2006 - 05/29/2007	5	3	0.273	ppm	20	ppm
Ammonia	X	12/20/2006 - 05/29/2007	7	2	0.689	ppm	25	ppm
Benzene	X	12/20/2006 - 05/29/2007	5	3	0.019	ppm	0.5	ppm
Butanal	X	12/20/2006 - 05/29/2007	5	1	0.00006	ppm	25	ppm

TANK FARM CHEMICAL EXPOSURE HAZARD ANALYSIS
B-Farm Replace Breather Filters
May 28, 2008

0508-364

Butanenitrile	X	12/20/2006 - 05/29/2007	5	0	ND		8	ppm
Dibutylbutylphosphonate	X	12/20/2006 - 05/29/2007	3	0	ND		0.01	ppm
Diethylphthalate	X	12/20/2006 - 05/29/2007	3	0	ND		5	mg/m3
Formaldehyde	X	12/20/2006 - 05/29/2007	5	4	0.007	ppm	0.3	ppm
Furan	X	12/20/2006 - 05/29/2007	5	0	ND		1	ppb
Heptanenitrile	X	12/20/2006 - 05/29/2007	5	0	ND		6	ppm
Hexanenitrile	X	12/20/2006 - 05/29/2007	5	0	ND		6	ppm
Mercury	X	12/20/2006 - 05/29/2007	5	0	ND		0.03	mg/m3
Methanol	X	12/20/2006 - 05/29/2007	5	3	0.015	ppm	200	ppm
Methylene Chloride		12/20/2006 - 05/29/2007	5	3	0.004	ppm	25	ppm
n-Nitrosodibutylamine		12/20/2006 - 05/29/2007	5	0	ND		4	ppb
n-Nitrosodiethylamine		12/20/2006 - 05/29/2007	5	0	ND		0.1	ppb
N-Nitrosodimethylamine	X	12/20/2006 - 05/29/2007	6	0	ND		0.3	ppb
n-Nitrosodipropylamine		12/20/2006 - 05/29/2007	5	0	ND		1	ppb
N-Nitrosomethylethylamine	X	12/20/2006 - 05/29/2007	5	0	ND		0.3	ppb
n-Nitrosomorpholine	X	12/20/2006 - 05/29/2007	6	0	ND		0.6	ppb
n-Nitrosopiperdine		12/20/2006 - 05/29/2007	5	0	ND		8	ppb

TANK FARM CHEMICAL EXPOSURE HAZARD ANALYSIS
B-Farm Replace Breather Filters
May 28, 2008

0508-364

n-Nitrosopyrrolidine		12/20/2006 - 05/29/2007	5	0	ND		4	ppb
Nitrous Oxide	X	12/20/2006 - 05/29/2007	5	3	9.545	ppm	50	ppm
Pentanenitrile	X	12/20/2006 - 05/29/2007	5	0	ND		5	ppm
Propanenitrile	X	12/20/2006 - 05/29/2007	5	0	ND		6	ppm
Pyridine	X	12/20/2006 - 05/29/2007	5	0	ND		1	ppm
Tri-n-butylphosphate	X	12/20/2006 - 05/29/2007	3	0	ND		0.2	ppm

Table 2. B-Farm Tank Headspace Measurements: 5/28/2008

Tank	Ammonia (ppm)	Flammable Gas (%)	Formaldehyde (ppm)	Mercury (mg/m^3)	Nitrous Oxide (ppm)	Oxygen (%)	VOC (ppm)	DRI#
B103	0	0	0	0.000289	33.4	20.5	7.05	08-01511
B105	0	0	0	0.000281	>1000	19.4	4.03	08-01511
B203	0	0	0	0.000024	4.5	20.5	0.68	08-01511
OEL	25	25%	0	0.025	50		2	

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INTEROFFICE MEMORANDUM

CH2MHILL
Hanford Group, Inc.

7X100-JWJ-07-036

Date: September 6, 2007

To: Industrial Hygiene Technicians

From: J.W. Jabara

Subject: INDUSTRIAL HYGIENE MONIORING AND SAMPLING PLAN FOR B-COMPLEX WORK ACTIVITIES

Subject:

This plan provides direction to industrial hygiene technicians in support of air sampling in B complex (B,BY,BX) tank farms. The purpose of this plan is to give general guidance for air sampling per the direction in TFC-ESHQ-S_IH-CD-35, Managing Vapor Control Zones (VCZ), and to meet the sampling expectations of TFC-PLN-34, Exposure Assessment Strategy. Task specific monitoring or sample plans supersede this plan.

B Complex Tank Farms Vapor Status:

VCZs have been established around tank farm perimeter fences at the B complex tank farms. Work inside VCZ requires the use of supplied air unless a Tank Farm Chemical Exposure Hazard Analysis (TFCEHA) has been prepared to down-post the VCZ as per TFC-ESHQ-S_IH-CD-35, Managing Vapor Control Zones.

Monitoring Agents:

Direct reading instrument air monitoring will be performed for flammable gases and vapors as directed by the applicable work document.

Personal Exposure Sampling:

Personal air samples collected for gases and vapors in B complex tank farms will be collected using the following guidelines. The responsible Industrial Hygienist (IH) can make modifications to these guidelines at any time and will specify the number and frequency of air samples.

Samples will be collected on both CH2M Hill and contractor employees working in the tank farms in accordance with TFC-PLN-34, Industrial Hygiene Exposure Assessment Strategy.

Table: Air sample media preparation for routine personal samples at B complex tank farms.

ANALYSIS	METHOD	MEDIA	HANDLING	FLOW RATE(LPM)		SAMPLE VOLUME(L)	
			Refrigerate	MIN	MAX	MIN	MAX
Ammonia	OSHA ID-188	SKC 226-29	Refrigerate	0.1	0.5	7.5	24
Mercury	NIOSH 6009	SKC 226-17-1A	Refrigerate	0.15	0.25	20	100
Formaldehyde	NIOSH 2016	SKC 226-119	Refrigerate	0.03	1.5	5	15
Nitrosamine	NIOSH 2522	Therosorb/N	Refrigerate	0.2	2	300	1000
Aliphatic Amines	OSHA 34/36/40	SKC 226-96	Refrigerate	0.1	0.2	5	10
Nitrous Oxide	Assay Tech	Badge[1]	Refrigerate	-	-	-	-
SVOC	TDU	Lab Supplied	Refrigerate	0.01	0.05	3	3
VOC[3]	TDU	Lab Supplied	Refrigerate	0.01	0.05	3	3
Pyridines	NIOSH 1613	SKC 226-01	Refrigerate	0.01	1	25	150
Methanol	NIOSH 2000	SKC 226-51	Refrigerate	0.02	0.2	1	5
Acetonitrile	NIOSH 1606	SKC 226-09	Refrigerate	0.01	0.2	5	25
1,3-Butadiene	NIOSH 1024	SKC 226-37[2]	Refrigerate	0.01	0.5	10	25
Aldehydes	NIOSH 2539	SKC 226-118	Refrigerate	0.01	0.05	5	5

1 **Minimum sampling time 30 minutes.**
2 **Requires two tubes in tandem.**
3 **To collect all VOC on COPC list, pyridines, methanol, acetonitrile, 1-3-Butadiene, and aldehydes must be collected.**

Exposure Sampling Protocol:

1. The IHT will prepare the sampling equipment as detailed above and collect the samples as per TFC ESHQ-S_IH-P-09, REV A-1 INDUSTRIAL HYGIENE PERSONAL/AREA EXPOSURE MONITORING.

2. The air sampling suite (up to 8 pumps) can be distributed among several employees as long as they are working on the same job.

3. The FWS and/or the shift supervisor will identify the person(s) who will be at greatest risk for chemical vapor exposure for the job. The IHT can request the FWS or assist in selecting the individual(s) to be sampled.

5. Collect the air samples for a full shift if possible. The sampler(s) can be taken off during lunch/breaks if necessary but it would be preferable to leave it on the employee. If the pump is taken off, stop it, record the time on the IH Field log, cap the sorbent tube, and secure the sample train in accordance with (IAW) TFC ESHQ-S_IH-P-09, REV A-1. Put the sample train back on the same employee when the break/lunch is finished. It is important to document on the IH field log whatever task the employee is doing as the sample is being collected.

6. The IHT will then accompany the employees to the Tank Farm change trailer and remove the sample train while the employees are dressing for the Tank Farm (TF) entry. The IHT will reapply the air sampling train once the employees are dressed for the TF entry.

7. The IHT will observe the sampled employees while they are in the field and monitor the security of the sample train if the employees must leave the TF for any reason.

8. The IHT will assist the sampled employees when the field task is completed by ensuring the sample train is secured when it is being radioactively cleared from the TF. The sample train should be allowed to continue to run during this time. The sample train will be left on the employee until the employee finishes his/her work shift.

9. The IHT will instruct the employee to wear the sample train until the end of his/her work shift. The IHT will check the sample train and sampled employee at least every 2 hrs and make arrangements with the employee to remove the sample train when the employee finishes the work shift.

10. If a full shift sample can not be collected, collect as long a sample as possible to represent the employee's exposure while performing the task at hand. Then interview the employee and ask what he/she is expecting to do for the remainder of the shift. Document the employee's reply as to his/her activities for the remainder of the work shift on the IH Field log.

11. Document all other field activities on the IH field log.

Data gathered from this monitoring and sampling will be used to evaluate employee exposure to gases and vapors as stated in the B Tank Vapor Information Sheet (TVIS).

Please direct questions or comments to Closure Operations Industrial Hygiene.

JWJ:TB

cc: T.J. Anderson, S7-70
K.A. Cutforth, S5-12
D.F. Farler, S7-70
JWJ File/LB
M.T. Hughey, S7-75
M.W. Jones, S7-70
M.L. Zabel, S7-70

JWJ File/LB

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WORK RELEASE CHECKLIST FOR OE'S

(For Operations Pre-Release Review)

Work Package No.: CLO-WO-08-0796 Reviewed By: B.L. Wallace Date: 5/29/08

Title: 241-B-103, 105 & 203 REPLACE G-1 BREATHER FILTERS WITH RADIAL FILTERS

Document Check:

N/A	YES		
○	✓	Work Instructions	
✓	○	Data Sheets	
○	✓	BOM	
○	✓	CACN listed	
✓	○	Hold Points	B-103, B-105 → ✓
○	✓	Waste Planning Checklist	
○	✓	WHA / JSA	
○	✓	Pre-Job Safety Meeting form	
○	✓	Attendance Roster	
○	✓	RWP COF-029	
○	✓	ALARA Management Worksheet	
✓	○	OTP (Operational Test Procedure)	
✓	○	ATP (Acceptance Test Procedure)	
○	✓	USQ Eval. # (TF-08-0908-S(R1) GCX-3	
○	✓	ECNs (# 725616 R-0)	
		(# 725639 R-0) (# _____)	
○	✓	Reference Drawings	
✓	○	Lockout / Tagout Authorization or AWT form prepared	
✓	○	Asbestos Work Permit / Negative Exposure Assessment	
✓	○	Hot Work Permit (fire watch required)	
✓	○	Confined Space Entry Permit	
✓	○	Non-Permit Confined Space monitoring form	
✓	○	Excavation Permit	
✓	○	Ground Scan	
✓	○	EEWP	
✓	○	Procedures	
○	✓	Vehicle Route Map	
✓	○	Critical Lift Procedure	
○	✓	Hoisting and Rigging Information	
○	✓	MSDS Sheets	
✓	○	Glove Bag / Containment Form	
✓	○	Ignition Source Control Requirements Screening	
✓	○	Standing Orders	

Limiting Conditions for Operation (LCOs):

N/A	YES		
✓	○	3.1.1	Transfer Leak Detection Systems
✓	○	3.1.2	Backflow Prevention Systems
✓	○	3.2.1	DST Primary Ventilation Systems
✓	✓	3.2.2	SST Flammable Gas Concentration
○	✓	3.2.3	SST 241-B-203 and 241-B-204 Passive Ventilation Systems

Administrative Controls (ACs):

N/A	YES		
✓	○	5.10	Flammable Gas Controls
✓	○	5.11	Transfer Controls
✓	○	5.12	Administrative Lock Controls
✓	○	5.13	Bulk Chemical Addition Controls
✓	○	5.14	Dome Loading Controls
✓	○	5.15	Tank Farm Instrumentation
✓	○	5.16	Corrosion Mitigation Controls
✓	○	5.17	Vacuum Retrieval Controls

242-A Administrative Controls (ACs):

N/A	YES		
✓	○	5.6.1.1	Restriction on 242-A Pump Room and Evaporator Room Access
✓	○	5.6.1.2	Sample Cubicle Leak Detection
✓	○	5.6.1.4	Fire Protection
✓	○	5.6.1.11	242-A Evaporator Instrumentation

Comments:

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WORK RELEASE CHECKLIST FOR OE'S (continued)

(For Operations Pre-Release Review)

Work Package No.: CLO-WO-08-0796 Reviewed By: B. L. Wallace Date: 5-29-08

Title: 241-B-103, 105 & 203 REPLACE G-1 BREATHER FILTERS WITH RADIAL FILTERS

		YES	N/A
1.	Is configuration of equipment and systems properly identified for safe operation while the work is being performed?	✓	○
2.	Is operability of the equipment and systems properly restored as part of the retesting? (SS/SC must address retest.)	✓	○
3.	Are the Lock and Tag steps required to install and remove included in the work document and are the forms complete and in the WP?	○	✓
4.	Are TSR, LCO, OSD, and AB requirements properly included? (Note for LCO entry/exit.)	✓	○
5.	Are work scope boundaries clear and the forms complete and in the WP?	✓	○

Comments:

WO Id: CLO-WO-08-0796

Waste Planning Checklist

1. Will waste be generated?	Yes
2. Will waste be generated in a radiological buffer area or contamination area?	Yes
3. Will EQ be removed? (TF-cover blocks, 222S-Process EQ)	Yes
4. Will waste contact process waste, tank waste, or tank waste contaminated material?	No
5. Will work involve soil removal?	No
6. Will there be any aerosol can(s) disposed of?	No
7. Will asbestos waste be disposed of?	No
8. Will HEPA filters be disposed of?	Yes
9. Will chemical products or paint be used or disposed of?	No
10. The following waste minimization techniques will be used?	Source Reduction and Wate Segrega

CHEMICAL/PAINT PRODUCTS

Msds No	Chemical / Product Name
020641	SAFEGARD 5022A
012261	SIMPLE GREEN
023671	QUICK N BRITE

11. GENERAL DESCRIPTION OF WASTE

Each Breather Filter (B-103, B-105 and B-203) removal will generate the following waste:
- Breather filter assembly including the butterfly valve. Approximately 180 lbs.
- HEPA filter, condensate : ~30 lbs
- Rags, plastic, tape : ~20 lbs
- Gaskets, bolts, nuts, and misc. parts: ~20 lbs

11a. Estimate Waste Generated Quanity:	750	LBS	Per:	Day	Job Length	1 day

WASTE MANAGEMENT CONTROLS **Comments**

12. Is Waste Regulated as a Dangerous Waste? No

12a. Disposition Instructions:

- Bring into radioactive contamination area only products/materials needed for the job.
- Survey and release unused products, then return to stock for future use.
- Segregate mixed waste from low-level waste.

MIXED WASTE DISPOSAL: (FOR B FARM HEPA FILTERS)
- Remove the HEPA filters from the filter housing and dispose of the filters and waste that contains condensate from B farm as mixed waste.
- Free liquid (e.g., condensate) is to be absorbed with polypropylene sorbent pads.
- If an SAA is not set up for B/BX/BY complex, FWS is to request a container and ensure delivery prior to the start of job.

LOW-LEVEL WASTE DISPOSAL:
- Dispose of the remaining debris waste (e.g., filter housing, plastic, rags not saturated with condensate, etc.) as low-level waste.
- FWS to request an 8'x4'x3' IP-1 metal box from Waste Operations dispatch and ensure delivery prior to the start of the job.

OTHER INSTRUCTIONS:
- Package waste in accordance with TO-100-052 procedure.

Designation Note:
1. Safegard 5022A is regulated as a product, but on debris in small amount (<10% by weight) is no longer regulated.
2. Simple Green and Quick n' Brite are not regulated per WAC 173-303 Dangerous Waste Regulations criteria.
3. Condensation of vapors and deposition of particulates from uncontained gasses from the tank vapor space does not constitute mixing under RCRA, and therefore listed waste codes do not apply to ventilation system components such as ductwork and HEPA filters.

13. Facility Operations has been notified to take samples? (N/A if not required)		N/A
14. Is a container already available for each disposition listed in the instructions?	No	Request containers
15. Does the quantity of the waste exceed capacity of available containers?	No	
16. Identify satellite accumulation area or accumulation area container(s) locations:	Requested containers	

Prepared By:Mandrake Pascual Date: 05/23/2008 Complete: ☑

Data Sheet 1 - QC Inspection Data

Radial HEPA Filter - QC Data Sheet*		
Filter component number where HEPA Filter will be Installed (i.e., B203-WST-FLT-101)	**B103-WST-FLT-101**	
Work Package Number	**CLO-WO-08-0796**	
Date of Inspection	5-27-08	
Radial HEPA Filter (Record Information From Manufacturer's Label)		
Filter Manufacturer	Flanders	
Model Number (identify letter designation of filter to indicate which drawing revision filter is fabricated to.)	**O-007-1-12-RF-NU-00-E3-Z04059** C	
Serial Number	1463453	
HEPA Filter Flow Rating	40 **(CFM)**	
HEPA Filter Resistance	.79 **(in. w.g.)**	
Manufacturer's Penetration Test Date	2-4-08	
Verify Filter Aerosol Penetration Has Been Tested by the Manufacturer and is No Greater than 0.03% at 100% of Rated Flow	**SAT**	**UNSAT****
	✓	
Seal (thread) Condition *(No significant damage or cross threading, etc.)*	**SAT**	**UNSAT****
	✓	
Comment:		

* Additional copies of this data sheet shall be made for each individual filter installed.

** Any UNSAT conditions found should be described in comments section and the System Engineer should be notified.

QC Inspector: Jon Elliott / Jon Elliott / 5-27-08

Signature / Print Name / Date

(Data sheets QC Inspections) 74

Data Sheet 1 - QC Inspection Data

Radial HEPA Filter - QC Data Sheet*		
Filter component number where HEPA Filter will be Installed (i.e., B203-WST-FLT-101)	**B105-WST-FLT-101**	
Work Package Number	**CLO-WO-08-0796**	
Date of Inspection	5.27.08	
Radial HEPA Filter (Record Information From Manufacturer's Label)		
Filter Manufacturer	Flanders	
Model Number (identify letter designation of filter to indicate which drawing revision filter is fabricated to.)	**O-007-1-12-RF-NU-00-E3-Z04059** C	
Serial Number	1463465	
HEPA Filter Flow Rating	40 **(CFM)**	
HEPA Filter Resistance	.79 **(in. w.g.)**	
Manufacturer's Penetration Test Date	2-4-08	
Verify Filter Aerosol Penetration Has Been Tested by the Manufacturer and is No Greater than 0.03% at 100% of Rated Flow	**SAT**	**UNSAT****
	✓	
Seal (thread) Condition *(No significant damage or cross threading, etc.)*	**SAT**	**UNSAT****
	✓	
Comment:		

* Additional copies of this data sheet shall be made for each individual filter installed.

** Any UNSAT conditions found should be described in comments section and the System Engineer should be notified.

QC Inspector: Jon Elliott / JON Elliott / 5.27.08

Signature / Print Name / Date

Data Sheet 1 - QC Inspection Data

Radial HEPA Filter - QC Data Sheet*		
Filter component number where HEPA Filter will be Installed (i.e., B203-WST-FLT-101)	**B203-WST-FLT-101**	
Work Package Number	**CLO-WO-08-0796**	
Date of Inspection	5-27-08	
Radial HEPA Filter (Record Information From Manufacturer's Label)		
Filter Manufacturer	Flanders	
Model Number (identify letter designation of filter to indicate which drawing revision filter is fabricated to.)	**O-007-1-12-RF-NU-00-E3-Z04059** C	
Serial Number	1463955	
HEPA Filter Flow Rating	40 **(CFM)**	
HEPA Filter Resistance	.81 **(in. w.g.)**	
Manufacturer's Penetration Test Date	2-4-08	
Verify Filter Aerosol Penetration Has Been Tested by the Manufacturer and is No Greater than 0.03% at 100% of Rated Flow	**SAT**	**UNSAT****
	√	
Seal (thread) Condition *(No significant damage or cross threading, etc.)*	**SAT**	**UNSAT****
	√	
Comment:		

* Additional copies of this data sheet shall be made for each individual filter installed.

** Any UNSAT conditions found should be described in comments section and the System Engineer should be notified.

QC Inspector: Jon Elliott / JON ELLIOTT / 5-27-08

Signature / Print Name / Date

CH2M BILL OF MATERIAL

ORIGINAL

B.O.M. Suppl. 0

d Use: 241-B-103, B-105, B-203		Wk. Pkg. No.: CLO-WO-08-000796		CACN/COA: 501957/FA30
te: 05/22/2008	Requestor: Gauck, Gregory J	Delivery Location: 2101-HV	Premium Freight ☐	Priority: 2.1	CGI: NA

te Required: 05/26/2008

| Mandatory ☐ Desired

ggested Vendor:

\ Clauses:
\ Materials availbable on site

Special Instructions/Emergency Justification:
Please assign to D. Shults. All items with Approval Designator Q* shall be inspected for Suspect / Counterfeit Items.

Gauck, Gregory J (373-1779)	05/22/2008	Baide, Dan (376-3274)	05/22/2008
Requestor	Date	Manager	Date
Gauck, Gregory J (373-1779)	05/27/2008	Bores, John F (376-8131)	05/28/2008
Engineer	Date	QA Engineer	Date
Not Required per DRA		Not Required per DRA	
RadCon	Date	Environmental	Date
Not Required per DRA		Not Required per DRA	
Industrial Health	Date	Chemical Management	Date
Not Required per DRA		Not Required per DRA	
Safety & Health	Date	Resp. Protection	Date
Milliken, Nancy J (376-7846)	05/28/2008	Duncan, Vella (373-3852)	05/28/2008
Cost Account Manager	Date	Material Coordinator Manager	Date
Shults, Duane L (373-4244)	05/29/2008		
Material Coordinator	Date		

n	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
1	24	5.00	GS				Q*	0	JE 5-29-08	05/29/2008, 24.00	moh	OTH0006656
	Unit	Delivery Date	Storage Level							Date/Qty Staged	Storage Bldg/Area	Storage Location
	EACH		B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)							05/29/2008, 24.00	2101HV/200E	DOCK

terial Description:
lt, Hvy Hex Hd 5/8"-11UNC-2A x 2" LG

Additional Description:
ASTM A193 Gr B8

chasing Description:

Comments:
Material on site. S/CI inspection required.

t Number
6

Equipment Type
FASTENERS

Manufacturer
Various

Drawing/ECN/Spec Number
ECN-725639-R0

n	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
2	6	5.00	GS				N/A	0	JE 5-29-08	05/29/2008, 6.00	moh	OTH0006657
	Unit	Delivery Date	Storage Level							Date/Qty Staged	Storage Bldg/Area	Storage Location
	EACH		B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)							05/29/2008, 6.00	2101HV/200E	DOCK

terial Description:
sket, 4" x 1/8" Thk for 4" 150# Flange, Compressed Figer Non Asbestos

Additional Description:
Garlock "Blue Gard"

chasing Description:

Comments:
Material on site.

t Number
2

Equipment Type
GASKET/SEALS/O-RING/PACK

Manufacturer
Garlock "Blue Gard"

Drawing/ECN/Spec Number
ECN-725639-R0

n	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
3	3	5.00	GS				Q*	0	JE 5-29-08	05/29/2008, 3.00	moh	OTH0006658
	Unit	Delivery Date	Storage Level							Date/Qty Staged	Storage Bldg/Area	Storage Location

EACH		B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)	05/29/2008, 3.00	2101HV/200E	DOCK

Material Description: lut, Winged 3/8"-16UNC Washer, Lock Spring 3/8" (Optional)
Additional Description:
Purchasing Description:
Comments: Material on site. S/CI inspection required.

Part Number	Equipment Type	Manufacturer	Drawing/ECN/Spec Number
90	FASTENERS	Various	ECN-725639-R0

Item	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
4	3	250.00	GS				N/A	0	JES-29-08	05/29/2008, 3.00	moh	OTH0006659

Unit	Delivery Date	Storage Level	Date/Qty Staged	Storage Bldg/Area	Storage Location
EACH		B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)	05/29/2008, 3.00	2101HV/200E	DOCK

Material Description: 0 cfm Weather Cover
Additional Description:
Purchasing Description:
Comments: Material on site.

Part Number	Equipment Type	Manufacturer	Drawing/ECN/Spec Number
05	HVAC	Various	ECN-725639-R0

Item	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
5	3	50.00	GS				N/A	0	JES-29-08	05/29/2008, 3.00	moh	OTH0006660

Unit	Delivery Date	Storage Level	Date/Qty Staged	Storage Bldg/Area	Storage Location
EACH		B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)	05/29/2008, 3.00	2101HV/200E	DOCK

Material Description: 0 cfm Breather Filter Bird Screen
Additional Description:
Purchasing Description:
Comments: Material on site.

Part Number	Equipment Type	Manufacturer	Drawing/ECN/Spec Number
29	HVAC	Various	ECN-725639-R0

Item	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
6	24	5.00	GS				Q*	0	JES-29-08	05/29/2008, 24.00	moh	OTH0006661

Unit	Delivery Date	Storage Level	Date/Qty Staged	Storage Bldg/Area	Storage Location
EACH		B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)	05/29/2008, 24.00	2101HV/200E	DOCK

Material Description: olt, Hvy Hex Hd 5/8"-11UNC-2A x 1-3/4"LG
Additional Description: ASTM A193 GR B8
Purchasing Description:
Comments: Material on site. S/CI inspection required.

Part Number	Equipment Type	Manufacturer	Drawing/ECN/Spec Number
01	FASTENERS	VARIOUS	ECN-725639-R0

Item	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
7	3	1375.00	GS				Q	3	JES-29-08	05/29/2008, 3.00	moh	OTH0006662

Unit	Delivery Date	Storage Level	Date/Qty Staged	Storage Bldg/Area	Storage Location
EACH		B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)	05/29/2008, 3.00	2101HV/200E	DOCK

Material Description:)AMPER, 4 IN. DIA, BUTTERFLY VALVE, F/WYE ASSY
Additional Description:
Purchasing Description:
Comments: Material on hand and green-tagged GS/QL-3.

art Number	Equipment Type	Manufacturer	Drawing/ECN/Spec Number
-LOK 362-173	VALVES	KEYSTONE	ECN-725639-R0

em	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
8	3	4000.00	GS				Q	3	JE 5-29-08	05/29/2008, 3.00	moh	OTH0006663

	Unit	Delivery Date	Storage Level	Date/Qty Staged	Storage Bldg/Area	Storage Location
	EACH		B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)	05/29/2008, 3.00	2101HV/200E	DOCK

Material Description:	Additional Description:
" dia filter mounting flange assembly	40 cfm Filter Mounting Flange Sub Assy.
Purchasing Description:	Comments: Material on hand and green-tagged GS/QL-3.

art Number	Equipment Type	Manufacturer	Drawing/ECN/Spec Number
23	HVAC	Various	ECN-725639-R0

PARTIAL RELEASE

Line # Released: _____

_____

Date Released: _____ Released To: _____

Signature: _____

RELEASED COMPLETE

Line # Released: ALL Released To: SC HVAC

Signature: [signature] 5-29-08

2

CH2M BILL OF MATERIAL

ORIGINAL

B.O.M. Suppl. 0

nd Use: B Farm Radial HEPA Filter		Wk. Pkg. No.: CLO-WO-08-0796 MB: MB-06-00009		CACN/COA: 501955/FA60
ate: 05/22/2008	Requestor: Hjellum, Al	Delivery Location: 2101HV	Premium Freight ☐	Priority: 2.1 / CGI:

ate Required: 05/28/2008

] Mandatory [X] Desired

uggested Vendor:

A Clauses:
/A

Special Instructions/Emergency Justification:
As defined in TFC-BMS-CP_CPR-C-06, the Engineering and Quality Assurance approvals for this Bill of Material are located in Master BOM MB-06-00009 and are not required to be obtained for each BOM created under the aforementioned Master BOM.

MATERIAL SUPPORT ... DATE 5-27-08 DJ

Name	Date	Name	Date
Hjellum, Al (372-2540)	05/22/2008	Not Required per DRA	
Requestor	**Date**	**Manager**	**Date**
Gauck, Gregory J (373-1779)	10/30/2006	Cannon, Joel M (372-3241)	10/30/2006
Engineer	**Date**	**QA Engineer**	**Date**
Not Required per DRA		Not Required per DRA	
RadCon	**Date**	**Environmental**	**Date**
Not Required per DRA		Not Required per DRA	
Industrial Health	**Date**	**Chemical Management**	**Date**
Not Required per DRA		Not Required per DRA	
Safety & Health	**Date**	**Resp. Protection**	**Date**
Not Required per DRA		Duncan, Vella (373-3852)	05/22/2008
Cost Account Manager	**Date**	**Material Coordinator Manager**	**Date**
Shults, Duane L (373-4244)	05/22/2008		
Material Coordinator	**Date**		

em	Quantity	Estimated Cost	Safety Class	HAZMAT	MSDS	NRTL	Approval Desig.	Quality Level	QC Approval	Date/Qty Ordered	Order No.	Catalog No.
1	3	213.91	GS				N/A	2	JE 5-27-08	05/22/2008, 3.00	10001678	0000632916

	Unit	Delivery Date	Storage Level	Date/Qty Staged	Storage Bldg/Area	Storage Location
	EACH		B - INDOORS (TEMPERATURE CONTROLLED/WEATHER TIGHT)	05/23/2008, 3.00	2101HV/200E	R7-E2

laterial Description: IEPA-TYPE FILTER, FILTER, HEPA, 40 CFM RADIAL, 1 1/2 IN. MNPT	Additional Description: FILTER, HEPA, RADIAL, 40 CFM NUCLEAR GRADE, PURCHASE PER RPP-SPEC-28675, CURRENT REV
urchasing Description:	Comments: For B-103, 105 & 203

art Number	Equipment Type	Manufacturer	Drawing/ECN/Spec Number
)-007-1-12-RF-NU-00-E3-Z04059C	FILTERS	FLANDERS FILTERS	RPP-SPEC-28675

103 - S/N # 1463453
105 # 1463465
203 # 1463455

PARTIAL RELEASE

Line # Released: ____________

Date Released: ________ Released To: ________

Signature: ____________

RELEASED COMPLETE

Line # Released: All Released To: SCHEER

Signature: [illegible] 5/29/08

[illegible]

241-B TANK FARM VEHICLE ROUTE MAP

Work Package: CLO-WO-08-0796 **Work Package Title:** 241-B-103, 105, 203 REPLACE BFs W RADIAL FILTERS

If a vehicle travels through the exclusion zones or over the domes of other tanks to reach the work location, the dome load log for each affected tank shall be updated. 30 ton Crane (59,630 lbs), Flat-bed truck (20,000 lbs) and Forklift (8,000 lbs) 33 TON CRANE (56,950 lbs) 40 ton

Exclusion zone entered (Yes/No): ___ 75 ton crane (107,400 lbs) Crane 73,325 lb

If yes, identify which tanks: B101, 102, 103, 104, 105, 106, 107, 109, 110, 112 and B201, 202 and 203, 204

Vehicle to cross over Cable Guard® or Linebacker® HD protector (Yes/No): ___ Support Van (15,000 lbs)

If yes, identify areas to be crossed on map and ensure requirements of TFC-OPS-OPER-C-10, Table 1 are followed.

Preparer: Mark Johnson Date: 5-22-08

Field Work Supervisor: Date: 5-22-08

Engineering: KJ HULL Date: 5/22/08

Shift Manager: Date: 5/29/08

Remarks:

(Route MAP)

OPERATIONS WORK PACKAGE (WP) ACCEPTANCE CHECKLIST

WP Number: CLO-WO-08-0796 Date: 8-6-8

Name of Reviewer: B.L. Walker

	WP Review for Operations Acceptance (Do not Ops Accept if any "NO" checked - Return to Work Control to resolve)	YES	NO	N/A
1.	Has the Field Work Supervisor signed the work package field work complete?	✓	○	○
	• Did the workers/FWS adequately document the work performed?	✓	○	○
	• Has the FWS written work requests for all failed or deficient SSC?	○	○	✓
	• Are the documented data, checklists and permits completed as required for the activity to allow it to be returned to Operations (Hold Points, supporting procedures, data sheets, signoffs, etc.)? o (Note Post Review signoffs are not required for Operations acceptance)	✓	○	○
2.	If the work package involves an ECN, has engineering closed out the ECN (Modification Complete Block signed)?	✓	○	○
	• If the work package involves a Temporary Modification ("TM" block is checked on the front page of the ECN), has engineering signed the "Restored To Original Status" block of the ECN? o Has the Temporary Modification been removed from the Temporary Modification Logbook? o Has the Caution Tag been removed from the Temporary Modification?	○	○	✓
3.	Has the Controlling Organization Lockout "work complete" block on the Tag Out Authorization Form been signed for the work package? • If a single point lockout/tag out or Authorized Worker Lockout was used, is the form filled out completely (i.e., work complete and lock removed)?	○	○	✓
4.	If a routing board update was required, was the routing board updated? • Were jumper leak check requirements implemented?	○	○	✓
5.	Is the current status of the SSC known and acceptable for turnover to Operations (i.e., operable, returned to service, out of service)?	✓	○	○

Comments:

ATTACHMENT A – PPE SELECTION CRITERIA AND GUIDANCE (cont.)

Table 1. Tanks Not Requiring Silvershield PPE.

241-A-101	241-BX-104	241-SX-102
241-A-102	241-BX-105	241-SX-103
241-AN-101	241-BX-107	241-SX-104
241-AN-102	241-BX-109	241-SX-105
241-AN-103	241-BX-110	241-SX-106
241-AN-104	241-BX-111	241-SX-108
241-AN-105	241-BX-112	241-SX-113
241-AN-106	241-BY-101	241-SX-115
241-AN-107	241-BY-102	241-SY-101
241-AP-101	241-BY-103	241-SY-102
241-AP-102	241-BY-104	241-SY-103
241-AP-103	241-BY-105	241-T-102
241-AP-104	241-BY-106	241-T-104
241-AP-105	241-BY-107	241-T-105
241-AP-106	241-BY-108	241-T-107
241-AP-107	241-BY-109	241-T-109
241-AP-108	241-BY-110	241-T-111
241-AW-101	241-BY-111	241-T-112
241-AW-102	241-BY-112	241-T-201
241-AW-103	241-C-101	241-T-202
241-AW-104	241-C-102	241-T-203
241-AW-105	241-C-103	241-T-204
241-AW-106	241-C-104	241-TX-104
241-AX-101	241-C-105	241-TX-113
241-AX-102	241-C-106	241-TX-116
241-AX-103	241-C-107	241-TX-118
241-AX-104	241-C-108	241-TY-104
241-AY-101	241-C-109	241-TY-106
241-AY-102	241-C-110	241-U-102
241-AZ-101	241-C-111	241-U-103
241-AZ-102	241-C-112	241-U-105
241-B-101	241-C-201	241-U-106
241-B-102	241-C-202	241-U-107
241-B-103	241-C-203	241-U-108
241-B-104	241-C-204	241-U-109
241-B-106	241-S-101	241-U-110
241-B-107	241-S-102	241-U-111
241-B-108	241-S-103	241-U-112
241-B-109	241-S-104	241-U-201
241-B-110	241-S-105	241-U-202
241-B-111	241-S-106	241-U-203
241-B-201	241-S-107	241-U-204
241-B-202	241-S-109	
241-B-203	241-S-110	
241-B-204	241-S-111	
241-BX-101	241-S-112	
241-BX-103	241-SX-101	

B-105 Requires Silver Shield

Silver Shield PPE

TANK FARM CHEMICAL EXPOSURE HAZARD ANALYSIS
B-Farm Replace Breather Filters
May 28, 2008

0508-364

Summary:

This hazard assessment has been conducted to review the Vapor Control Zone (VCZ) requirements for non-intrusive tank/tank system work within B-Farm to support CLO-WO-08-0796, 241-B-103, B-105, and B-203, Replace G-1 Breather Filters with New Radial Filters. The entire farm is currently posted as a VCZ requiring supplied air. Based upon this hazard assessment as per TFC-ESHQ-S_IH-CD-48, Managing Vapor Control Zones, the B-Farm VCZ controls can be modified at the affected work area associated with CLO-WO-08-0796, 241-B-103, B-105, and B-203, Replace G-1 Breather Filters with New Radial Filters.

Work Activity/Task:

1. The work activities are specified in CLO-WO-08-0796, 241-B-103, B-105, and B-203, Replace G-1 Breather Filters with New Radial Filters.
2. The work activities do not require waste-disturbing activities.

Comparable Activities:

1. Personal air sampling during work in B-Farm showed no exposure measurements approaching 10% of the occupational exposure limits (OELs) of Tank Farm Chemicals of Potential Concern (COPCs), reported in 7X100-JWJ-07-011, Results of Personal Air Sampling Conducted in B/T/U Tank Farms from May 2004 - December 2006.
2. Further review of personal air sampling for work around B-Farm vapor sources showed no exposure measurements approaching 10% of the OELs of Tank Farm COPCs from May 2006-May 2007 (Table 1).
3. Direct reading monitoring for ammonia and volatile organic compounds conducted on 3/22/07 during repair of the B-202 ENRAF (DRI # 07-00702) showed no detectable airborne concentrations of the chemicals.
4. This work activity is not waste disturbing.

Hazard Identification:

1. B-Farm vapor characterization has not been completed. The current list of Tank Farm COPCs (published on the Safety and Health Web Page) may be present in work areas.
2. Source air samples were collected as per 73D20-JWJ-08-075, Industrial Hygiene Sample Plan: B Farm Tanks Headspace Air Samples to evaluate worst case emissions to evaluate the current condition of the tank(s) gas and vapor environment. The air samples were analyzed for ammonia, volatile organic compounds (VOC), mercury vapor, formaldehyde, nitrous oxide and a gas chromatograph - mass spectrometor (GC-MS) scan:

    a. The source air samples results in Table 2 show that nitrous oxide and volatile organic compounds exceeded the Tank Farm action limit (TFAL) of 50 ppm and 25 ppm respectively in B-103 and B-105. The remaining source air samples did not show levels exceeding TFALs.

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b. The mass spectrograph – gas chromatograph (MS-GC) scan did not show any unknown chemicals which would present a health hazard to workers performing this activity.

3. Personal air sampling during work in B-Farm showed no exposure measurements approaching 10% of the OELs of Tank Farm COPCs (7X100-JWJ-07-011, Results of Personal Air Sampling Conducted in B/T/U Tank Farms from May 2004 - December 2006).
4. Further review of personal air sampling for work around at B-Farm vapor sources showed no exposure measurements approaching 10% of OELs of the Tank Farm COPCs from May 2006- May 2008 (Table 1).

Data Review:

1. The source air samples results collected as per 73D20-JWJ-08-075, Industrial Hygiene Sample Plan: B Farm Tanks Headspace Air Samples showed that nitrous oxide and volatile organic compounds exceeded the Tank Farm action limit (TFAL) of 50 ppm and 25 ppm respectively in B-103 and B-105 (Table 2).
2. Personal air sampling during work in B-Farm showed no exposure measurements approaching 10% of the OELs of Tank Farm COPCs (7X100-JWJ-07-011, Results of Personal Air Sampling Conducted in B/T/U Tank Farms from May 2004 - December 2006).
3. Further review of personal air sampling for work around at B-Farm vapor sources showed no exposure measurements approaching 10% of OELs of the Tank Farm COPCs from May 2006- May 2008 (Table 1).
4. There is no TWINS vapor data on the affected B-Farm tanks collected in the last 10 years. Discussions with Process Engineering indicated there is no additional chemical information for these tanks than what is currently available.

Vapor Hazard Controls:

1. Full-face air purifying respirators with GME-P100 cartridges are prescribed for this work.
2. The IHT will conduct air monitoring in the active work area for nitrous oxide (N_2O) as per TFC-ESHQ-S_IH-D-32, REV A-2, MIRAN® 205B Series SAPPHIRE Instrument Operation. The IHT will collect a running 25 minute air sample into a 25 liter Tevlar sample bag with a SKC air sample pump @ 1 liter per minute. The Tevlar bag N_2O air samples will be analyzed with the Miran 205B in the B-Farm change trailer. The N_2O air samples will be collected and analyzed for the duration of the job.
3. The IHT will conduct air monitoring in the work area for ammonia as per TF-OPS-IHT-004, A-1, Preparation and Field Use of the iSP Motorized Sampling Pump and the iTX Multi-Gas Monitor.
4. The IHT will conduct air sampling and monitoring as per 7X100-JWJ-07-036, Industrial Hygiene Monitoring and Sampling Plan for B-Complex Work Activities.
5. If IHT monitoring detects ammonia concentrations exceeding the Tank Farm Chemical Action Limit of 12 ppm or N_2O exceeding 25 ppm in work area during the operation, the work will be paused and the workers placed in a safe configuration and the issue resolved before the work proceeds. If area ammonia or N_2O levels remain above their respective chemical action limits for 15 minutes, the air purifying respirator can no longer be used and supplied air will be required for the VCZ in B-Farm.

(P100 APR) 85

TANK FARM CHEMICAL EXPOSURE HAZARD ANALYSIS

B-Farm Replace Breather Filters

May 28, 2008

0508-364

Title:	Name:	Signature:	Date:	Phone:
Industrial Hygienist:	J.W. Jabara, CIH		5/28/08	373-1385
IH Reviewer:	D.L. Merrill, CIH		5/28/08	373-2605
IH Manager:	K.A. Roueche	Kim Roueche	5/29/08	372-3310
Operations Manager:	R. Cook	Randy W. M. Cook	5/29/08	372-1450

Table 1. Personal Air Samples collected in B-Farm From 05/01/2006 To 05/01/2008

Agent	COPC	Date Range	# Samples Taken	# Above Detection Limit	Highest Concentration	UOM	TWA OEL	OEL UOM
1,1 biphenyl	X	12/20/2006 - 05/29/2007	3	0	ND		0.2	ppm
1-Butanol	X	12/20/2006 - 05/29/2007	5	3	0.003	ppm	20	ppm
2, 4-Dimethylpyridine	X	12/20/2006 - 05/29/2007	5	0	ND		0.5	ppm
2,5-Dihydrofuran	X	12/20/2006 - 05/29/2007	5	0	ND		1	ppb
2-Hexanone	X	12/20/2006 - 05/29/2007	5	0	ND		5	ppm
3-Buten-2-one	X	12/20/2006 - 05/29/2007	5	1	0.0001	ppm	0.2	ppm
Acetaldehyde	X	02/23/2007 - 05/29/2007	3	2	0.005	ppm	25	ppm
Acetonitrile	X	12/20/2006 - 05/29/2007	5	3	0.273	ppm	20	ppm
Ammonia	X	12/20/2006 - 05/29/2007	7	2	0.689	ppm	25	ppm
Benzene	X	12/20/2006 - 05/29/2007	5	3	0.019	ppm	0.5	ppm
Butanal	X	12/20/2006 - 05/29/2007	5	1	0.00006	ppm	25	ppm

TANK FARM CHEMICAL EXPOSURE HAZARD ANALYSIS
B-Farm Replace Breather Filters
May 28, 2008

0508-364

Butanenitrile	X	12/20/2006 - 05/29/2007	5	0	ND		8	ppm
Dibutylbutylphosphonate	X	12/20/2006 - 05/29/2007	3	0	ND		0.01	ppm
Diethylphthalate	X	12/20/2006 - 05/29/2007	3	0	ND		5	mg/m3
Formaldehyde	X	12/20/2006 - 05/29/2007	5	4	0.007	ppm	0.3	ppm
Furan	X	12/20/2006 - 05/29/2007	5	0	ND		1	ppb
Heptanenitrile	X	12/20/2006 - 05/29/2007	5	0	ND		6	ppm
Hexanenitrile	X	12/20/2006 - 05/29/2007	5	0	ND		6	ppm
Mercury	X	12/20/2006 - 05/29/2007	5	0	ND		0.03	mg/m3
Methanol	X	12/20/2006 - 05/29/2007	5	3	0.015	ppm	200	ppm
Methylene Chloride		12/20/2006 - 05/29/2007	5	3	0.004	ppm	25	ppm
n-Nitrosodibutylamine		12/20/2006 - 05/29/2007	5	0	ND		4	ppb
n-Nitrosodiethylamine		12/20/2006 - 05/29/2007	5	0	ND		0.1	ppb
N-Nitrosodimethylamine	X	12/20/2006 - 05/29/2007	6	0	ND		0.3	ppb
n-Nitrosodipropylamine		12/20/2006 - 05/29/2007	5	0	ND		1	ppb
N-Nitrosomethylethylamine	X	12/20/2006 - 05/29/2007	5	0	ND		0.3	ppb
n-Nitrosomorpholine	X	12/20/2006 - 05/29/2007	6	0	ND		0.6	ppb
n-Nitrosopiperdine		12/20/2006 - 05/29/2007	5	0	ND		8	ppb

n-Nitrosopyrrolidine		12/20/2006 - 05/29/2007	5	0	ND		4	ppb
Nitrous Oxide	X	12/20/2006 - 05/29/2007	5	3	9.545	ppm	50	ppm
Pentanenitrile	X	12/20/2006 - 05/29/2007	5	0	ND		5	ppm
Propanenitrile	X	12/20/2006 - 05/29/2007	5	0	ND		6	ppm
Pyridine	X	12/20/2006 - 05/29/2007	5	0	ND		1	ppm
Tri-n-butylphosphate	X	12/20/2006 - 05/29/2007	3	0	ND		0.2	ppm

Table 2. B-Farm Tank Headspace Measurements: 5/28/2008

Tank	Ammonia (ppm)	Flammable Gas (%)	Formaldehyde (ppm)	Mercury (mg/m^3)	Nitrous Oxide (ppm)	Oxygen (%)	VOC (ppm)	DRI#
B103	0	0	0	0.000289	33.4	20.5	7.05	08-01511
B105	0	0	0	0.000281	>1000	19.4	4.03	08-01511
B203	0	0	0	0.000024	4.5	20.5	0.68	08-01511
OEL	25	25%	0	0.025	50		2	

CH2M HILL ENGINEERING CHANGE NOTICE

Page 1 of 18 14 CD 05/27/08 ☐ DM ☒ FM ☐ TM

1a. ECN 725639 R 0

1b. Proj. ECN N/A - - R

2. Simple Modification ☒ Yes ☐ No	3. Design Inputs – For full ECNs, record information on the ECN-1 Form (not required for Simple Modifications)		4. Date 3/28/08
5. Originator's Name, Organization, MSIN, & Phone No. GJ Gauck, CH2M Hill, S7-24, 373-1779	6. PrHA Number No. PrHA-00280 R - 0 ☐ N/A	7. USQ Number No. TF - 08 – 0876 - D R - 0 ☐ N/A	8. Related ECNs NA
9. Title 241-B-103, B-105, B-203 Butterfly Valve and Filter Replacement	10 Bldg. / Facility No. 241B/241-B-103, 105, 203	11. Equipment / Component ID See Page 3	12. Approval Designator E
13. Engineering Documents/Drawings to be Changed (Incl. Sheet & Rev. Nos.) See page 3		14. Safety Designation ☐ SC ☐ SS ☒ GS ☐ N/A	15. Expedited/Off-Shift ECN? ☐ Yes ☒ No
16a. Work Package Number CLO-WO-08-0796	16b. Modification Work Completed DG BAIDE 6/10/08 Grey Gauck 6/9/08 Responsible Engineer / Date	16c. Restored to Original Status (TM) JUN 10 2008 N/A 18 STA. 3 Responsible Engineer / Date	17. Fabrication Support ECN? ☐ Yes ☒ No

18. **Description of the Change** (Use ECN Continuation pages as needed)

PROBLEM: The 241-B-103, 241-B-105, and 241-B-203 breather filters are installed using "G1" housing. These filters recently failed aerosol testing. See PER-2008-0984, 0983, and 0985. In response management determined that these filters and housings would be removed and replaced with a radial breather filter assembly.

ANALYSIS: The 241-B-103 breather filter wye assembly is attached to the 12" tank riser (Riser 7) with a 12" to 4" reducer flange. The 241-B-105 breather filter assembly is attached to the 12" tank riser (Riser 8) with a buried 12" to 4" reducer flange. The 241-B-203 breather filter assembly is attached to a 4" tank riser (Riser 4).

The current G-1 filter housings and butterfly valves will be removed at a 4" outside diameter flange. Due to the lighter construction weight of the radial assembly (approximately 60 lbs) compared to the G1 filter and housing assembly (approximately 100 lbs) and lower center of gravity there is no adverse impact to the structural integrity and seismic moment of the final radial filter assembly.

TE-05-020, Rev.4 Technical Evaluation for Use of Flanders 40 CFM Radial Nuclear HEPA Filter on Hanford Tank Passive Ventilation System for ASME AG-1 compliance and TE-08-029, Rev.0 provides the justification for tank farm installation of radial filters in all Tank Farms including the smaller 200 Series Tanks i.e.,241-B-203. (Continued page 3)

19. **Justification of the Change** (Use ECN Continuation pages as needed) Engineering Rework ☐ Yes ☒ No

The old G-1 breather filter assembly installed on tanks 241-B-103, 241-B-105, and 241-B-203 are being replaced with a new radial filter assembly as requested by Operations. This decision was made following the HEPA filters efficiency test failures documented in PERs PER-2008-0984, 0983, and 0985 respectively.

20. **ECN Category**

☐ Direct Revision
☒ Supplemental
☐ Void/Cancel

ECN Type

☐ Supersedure
☐ Revision

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21. **Distribution**

Name	MSIN	Name	MSIN
DG Baide	S7-24	MA Fish	S7-24
RP Tucker	S7-83	AD Hjellum	S7-92
JS Conrad	S7-03	SD Doss	S7-03
SD Doss	S7-03		
TR Farris	S7-27		
GJ Gauck	S7-27		
KJ Hull	S7-27		

Release Stamp

MAY 27 2008
DATE:
STA: 3
HANFORD RELEASE
ID: 18

JUN 10 2008 STA. 3

CH2M HILL ENGINEERING CHANGE NOTICE

Page 2 of ~~13~~ 14

☐ DM ☒ FM ☐ TM

1a. ECN 725639 R 0

1b. Proj. ECN N/A - - R

22. **Revisions Planned** (Include a brief description of the contents of each revision)
None

Note: All revisions shall have the approvals of the affected organizations as identified in block 12 "Approval Designator," on page 1 of this ECN.

23. **Commercial Grade Item Dedication Numbers** (associated with this design change)
N/A

24. **Engineering Data Transmittal Numbers** (associated with this design change, e.g., new drawings, new documents)
N/A

25. **Other Non Engineering (not in HDCS) documents that need to be modified due to this change**

Type of Document	Document Number	Update Completed On	Responsible Engineer (print/sign and date)
Alarm Response Procedure	N/A	N/A	N/A
Operations Procedure	N/A	N/A	N/A
Maintenance Procedure	3-VB-157B	6/10/08	[signature]
Type of Document	Document Number	Type of Document	Document Number
See Page 3			

26. **Field Change Notice(s) Used?**
☐ Yes ☒ No
If Yes, Record Information on the ECN-2 Form, attach form(s), include a description of the interim resolution on ECN Page 1, block 18, and identify permanent changes.

NOTE: ECNs are required to record and approve all FCNs issued. If the FCNs have not changed the original design media then they are just incorporated into the design media via an ECN. If the FCN did change the original design media then the ECN will include the necessary engineering changes to the original design media.

27. **Design Verification Required?**
☐ Yes ☒ No
If Yes, as a minimum attach the one page checklist from TFC-ENG-DESIGN-P-17.

28. **Approvals**

Facility/Project Signatures		Date	A/E Signatures	Date
Resp. Engineer	GA Gauck [signature]	5-20-08	Originator/Design Agent	
Resp. Manager	DG Baide [signature]	5-23-08	Professional Engineer	
Quality Assurance			Project Engineer	
IS&H Engineer			Quality Assurance	
NS&L Engineer			Safety	
Environ. Engineer	~~S Doss~~ CANCEL [signature]	5/22/08	Designer	
Engineering Checker	TR Farris [signature]	5/22/08	Environ. Engineer	
Other	BX Farm System Engineer K. Hull [signature]	5/20/08	Other	
Other			Other	
Other			DEPARTMENT OF ENERGY / OFFICE OF RIVER PROTECTION	
Other			Signature or a Control Number that tracks the Approval Signature	
Other				
Other			ADDITIONAL SIGNATURES	
Other				
Other				

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JUN 10 2008 STA 3 18

CH2M HILL ENGINEERING CHANGE NOTICE CONTINUATION SHEET	1a. ECN 725639 R 0
Page 3 of 13 14	1b. Proj. ECN N/A - - R

Document/Drawing No. N/A	Sheet N/A	Revision N/A

Box 11, Equipment/Component ID: B103-WST-FLT-101, B105-WST-FLT-101, B203-WST-FLT-101

Box 18, Description of Change (Continued from page 1)

ANALYSIS (cont.): TE-08-029, Rev.0 "Technical Evaluation for the B-103, B-105, and B-203 Radial Breather Filter Installation provides an evaluation for radial breather installation acceptance on these tanks based on their documented heat generation rates

SOLUTION: The G-1 breather filter will be replaced with a radial breather filter on tanks 241-B-103, 241-B-105. and 241-B-203. Additionally, the wafer style butterfly valves will be replaced with the lug body butterfly valve as shown in the design media H-2-90718 Assy 350.

H-2-73281, Sht.1 Rev. 4: Change Isolation Drawing to show radial breather filter installed on 241-B-103 Riser 7 as shown on page 4 and 5 of this ECN.

H-2-73283, Sht.1 Rev. 4: Change Isolation Drawing to show radial breather filter installed on 241-B-105, Riser 8 as shown on page 6 and 7 of this ECN.

H-2-73290, Sht.1 Rev. 4: Change Isolation Drawing to show radial breather filter installed on 241-B-203, Riser 4 as shown on page 8 and 9 of this ECN.

H-14-010610, Sht.1, Rev. 6: Change the Riser and Nozzle Schedule on the drawing to show radial breather filter installed on 241-B-103 and 241-B-105 as shown on page 10 and 11 of this ECN.

2 cf 05/27/08

H-14-010610, Sht.3, Rev. 5: Change the Riser and Nozzle Schedule on the drawing to show radial breather filter installed on 241-B-203 as shown on page 12 and 13 of this ECN.

WORK INSTRUCTIONS: See specific work package for work instructions.

POST MAINTENANCE TESTING: An AG-1 checklist will be completed after installation for inspection of the riser assembly.

Box 25, Other Non Engineering Documents (Continued from page 1)

Type	Document Number(s)	Update Completed on (Date)	Responsible Engineer (Print/Sign) Date
New Radial Replacement	WT-106383	6/9/08	Greg Gauck 6/9/08
	WT-106385,	6/9/08	Greg Gauck 6/9/08
	WT-106386	6/9/08	Greg Gauck 6/9/08
Old Filter Replacement	WT-06807	6/9/08	Greg Gauck 6/9/08
	WT-06809	6/9/08	Greg Gauck 6/9/08
	WT-06816	6/9/08	Greg Gauck 6/9/08
Old Filter BFAT	WT-05147	6/9/08	Greg Gauck 6/9/08
	WT-05062	6/9/08	Greg Gauck 6/9/08
	WT-05251	6/9/08	Greg Gauck 6/9/08

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Note: An AutoCAD page may be used in place of this form (the header section items must be included on the AutoCAD page).

CH2M HILL ENGINEERING CHANGE NOTICE

Page 1 of 11 12 (5.28.08)

☒ DM ☐ FM ☐ TM

1a. ECN 725616 R 0

1b. Proj. ECN - - R

2. Simple Modification ☒ Yes ☐ No	3. Design Inputs – For full ECNs, record information on the ECN-1 Form (not required for Simple Modifications)		4. Date 05-11-08
5. Originator's Name, Organization, MSIN, & Phone No. GJ Gauck, COSE, S7-24, 373-1779	6. PrHA Number No. PrHA-00296 R - 0 ☐ N/A	7. USQ Number No. TF - 08 - 0910 - D R - 0 ☐ N/A	8. Related ECNs NA
9. Title Revise H-2-90718 details for radial filter bird screen and isolation valve	10. Bldg. / Facility No. 241-G	11. Equipment / Component ID NA	12. Approval Designator NA
13. Engineering Documents/Drawings to be Changed (Incl. Sheet & Rev. Nos.) ***See Page 3***		14. Safety Designation ☐ SC ☐ SS ☒ GS ☐ N/A	15. Expedited/Off-Shift ECN? ☐ Yes ☒ No
16a. Work Package Number NA	16b. Modification Work Completed NA Responsible Engineer / Date	16c. Restored to Original Status (TM) NA Responsible Engineer / Date	17. Fabrication Support ECN? ☐ Yes ☒ No

18. **Description of the Change** (Use ECN Continuation pages as needed)

Problem:

- Drawing H-2-90718, Sheet 16, Rev.8: The material/reference for the Item 228 on drawing H-2-90718, sheet 16 used to construct the 40 cfm breather filter bird screen was unnecessarily limited to 304L SST (stainless steel). Any Grade 300 SST is adequate.

- Drawing H-2-90718, Sheet 25, Rev.0: The 4" radial filter butterfly valve shown as Item #171 on assembly 350 on drawing H-2-90718, Sheet 25 notes two different bolt sizes are needed in eight places each. QA has requested that each of the different sized bolts be noted on affected drawings in separate locations.

- Drawing H-2-90718, Sheet 17, Rev. 4. Assembly 350 and 351 showing the radial filter isolation butterfly valve shows a wafer body valve rather than a lug body valve.

- Drawing H-2-90718, Sheet 2, Rev. 12. Note is needed to clarify the installation of radial filter lug body butterfly isolation valve.

19. **Justification of the Change** (Use ECN Continuation pages as needed) Engineering Rework ☐ Yes ☒ No

This change is necessary to incorporate QA recommendations for the radial breather filter assemblies drawings regarding the butterfly isolation valves, weather shields, fasteners and birdscreen fabrication/construction material.

20. ECN Category

☐ Direct Revision
☒ Supplemental
☐ Void/Cancel

ECN Type

☐ Supersedure
☐ Revision

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21. Distribution

Name	MSIN	Name	MSIN
GJ Gauck	S7-24	A Hjellum	S7-92
JM Cannon	S7-07		
DG Baide	S7-24		
TR Farris	S7-24		
KW Willoughby	S7-07		
SD Doss	S7-03		
JF Bores	S7-07		

Release Stamp

DATE: MAY 28 2008
STA: 3
HANFORD RELEASE
ID: 18

CH2M HILL ENGINEERING CHANGE NOTICE	1a. ECN 725616 R 0
Page 2 of ~~12~~ 13 ☒ DM ☐ FM ☐ TM	1b. Proj. ECN - - R

22. **Revisions Planned** (Include a brief description of the contents of each revision)
No

Note: All revisions shall have the approvals of the affected organizations as identified in block 12 "Approval Designator," on page 1 of this ECN.

23. **Commercial Grade Item Dedication Numbers** (associated with this design change)	24. **Engineering Data Transmittal Numbers** (associated with this design change, e.g., new drawings, new documents)

25. **Other Non Engineering (not in HDCS) documents that need to be modified due to this change**

Type of Document	Document Number	Update Completed On	Responsible Engineer (print/sign and date)
Alarm Response Procedure	N/A		
Operations Procedure	N/A		
Maintenance Procedure	N/A		

Type of Document	Document Number	Type of Document	Document Number
N/A			

26. **Field Change Notice(s) Used?**
☐ Yes ☒ No
If Yes, Record Information on the ECN-2 Form, attach form(s), include a description of the interim resolution on ECN Page 1, block 18, and identify permanent changes.

NOTE: ECNs are required to record and approve all FCNs issued. If the FCNs have not changed the original design media then they are just incorporated into the design media via an ECN. If the FCN did change the original design media then the ECN will include the necessary engineering changes to the original design media.

27. **Design Verification Required?**
☐ Yes ☒ No
If Yes, as a minimum attach the one page checklist from TFC-ENG-DESIGN-P-17.

28. **Approvals**

Facility/Project Signatures		Date	A/E Signatures		Date
Resp. Engineer	GJ Gauck	5/23/08	Originator/Design Agent		
Resp. Manager	DG Baide	5-22-08	Professional Engineer		
Quality Assurance	JM Cannon	5/23/08	Project Engineer		
IS&H Engineer			Quality Assurance		
NS&L Engineer			Safety		
Environ. Engineer			Designer		
Engineering Checker	TR Farris	5-23-08	Environ. Engineer		
Other			Other		
Other			Other		
Other			DEPARTMENT OF ENERGY / OFFICE OF RIVER PROTECTION		
Other			Signature or a Control Number that tracks the Approval Signature		
Other					
Other			ADDITIONAL SIGNATURES		
Other					
Other					

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CH2M HILL ENGINEERING CHANGE NOTICE CONTINUATION SHEET	1a. ECN 725616 R 0
Page 3 of 12 / 2	1b. Proj. ECN - - R

Document/Drawing No. NA Sheet NA Revision NA

Block 13 Engineering Documents/Drawings to be Changed (continued from Page 1)

H-2-90718 Sht. 16, Rev. 8
H-2-90718 Sht. 25, Rev. 0
H-2-90718 Sht. 17, Rev. 4
H-2-90718, Sht .2, Rev. 12

Block 18 Description of the change (continued from Page 1)

Problems (Continued)

- Labels applied to the weather shield covering the radial filter (Item #205) showing the drawing series, H-2-90718, Sheet 25, Rev.0 and differing assembly numbers are providing confusing field application.
- The installation direction of the radial filter butterfly valve in not given in the drawing. This could lead to improper installation of the radial filter butterfly valve.
- QC requested that the installation direction of the radial filter butterfly valve be indicated in the drawing with reference to the preferred flow direction given on the radial filter butterfly valve.

Analysis:

- Drawing H-2-90718, Sheet 16, and Rev.8: The use of 304L SST or low carbon stainless steel is normally used when welding of the stainless steel is necessary. No welding is needed to fabricate the bird screen so any Grade 300 SST is adequate.
- QA has requested that each of the two different sized bolts be noted on the drawing in separate locations to help clarify that different sized bolts are needed i.e., 1-3/4" bolts and 2" bolts.
- Lug body valves which are used should show eight bolts to fasten the top of the valve to the filter spool piece and eight bolts to fasten the bottom of the valve to the tank riser or ducting.
- Weather covers had labels applied based on their application when originally fabricated or purchased. The weather covers can now be ordered from Flanders as a stock item and can be used in the field for different assembly installations making the labels details other then the drawing H-2-90718, i.e., Sheet, Revision, and Assembly numbers variable.
- Discussed answer with QA and cam up with an expectable solution.

Solution:

- Drawing H-2-90718, Sheet 16, and Rev.8: Replace material/reference for the Item 228 on drawing H-2-90718, sheet 16 from 304L SST (stainless steel) to."Any 300 SS".
- Show the two different radial filter butterfly valve fasteners in different location on drawing H-2-90718, Sht 25 for assemblies 350 and 351 and Sht 17 for assemblies 225, 226, 237, and 238. The 1-3/4" length bolts will be identified under Item #201 in 8 places (8Pl) the 2" length bolts will be identified under Item #196 also in 8 places (8Pl).
- Show lug body valve on drawing H-2-90718, Sht 25 for assemblies 350 and 351 and Sht 17 for assemblies 226 and 238.
- All weather covers used with radial filters will be labeled to only reflect the drawing series under drawing number H-2-90718. Changes will be reflected on Sht 25 for assemblies 350 and 351 and on Sht 17 for assemblies 226, 237, and 238.
- A note has been added on Sht 2 along with a blow-up of the valve on Sht 25 providing bolt installation clarification.

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Test/Inspection:

NA

MSDS # 023671

QUICK 'n BRITE, INC.
22313 70th Avenue West
Mountlake Terrace, WA 98043
Emergency Phone: 425-778-8285

N/A = NOT APPLICABLE
NA = NOT AVAILABLE

MATERIAL SAFETY DATA SHEET
PRODUCT NAME: QUICK 'n BRITE PASTE

Prepared By: K. Woods in accordance with OSHA and WHMIS requirements — Date: March 3, 2000

CHEMICAL FAMILY: Mixture — FORMULA: Proprietary Mixture of Sodium Cocoate,emulsifiers,water conditoners, and water

HAZARDOUS INGREDIENTS (CAS #):	%	EXPOSURE LIMITS, ppm: ACGIH TLV	OSHA-PEL
NONE	N/A	N/A	N/A

This product contains no ingredients considered hazardous according to the criteria of 29 CFR 1910.1200 or listed on the Ingredient Disclosure List. This product contains no chemical regulated under SARA 313 as a reportable substance.

CARCINOGENIC INGREDIENTS: Contains no known or suspected carcinogens.

PHYSICAL PROPERTIES:
- Boiling Point: about 200 degrees F
- Solubility in Water: Appreciable
- Specific Gravity - Liquid (H_2O = 1): 1.01-1.02
- Odor and Appearance: Pink paste; mild scent
- pH (as is): 8.0-9.5
- % Volatiles: N/A (Non-volatile mixture)
- % Volatile Organic Content (VOC): 0
- Vapor Pressure: N/A
- Vapor Density (Air=1): N/A

FIRE AND EXPLOSION DATA:
- Flash Point: None
- Extinguishing Media: Water, CO_2, foam, dry chemical
- Special Firefighting Procedures: None
- Flammability Limits: N/A
- Unusual Hazards: None

HEALTH EFFECTS:
- Effects of overexposure: May cause minor temporary eye irritation. Ingestion may cause nausea or diarrhea.
- Chronic effects of overexposure: None known or expected.
- Medical conditions that may be aggravated by exposure: None known or expected.
- Primary routes of entry: Ingestion

EMERGENCY AND FIRST AID PROCEDURES:
- Eye Contact: Flush thoroughly with plenty of water for several minutes. If irritation persists, see a physician.
- Skin Contact: Flush thoroughly from skin with water. If irritation persists, see a physician.
- Ingestion: Drink plenty of water and call a physician immediately.
- Inhalation of dust: N/A

REACTIVITY DATA:
- Stability: Stable
- Incompatibility: None
- Conditions to Avoid: None
- Hazardous Polymerization: Will not occur.
- Hazardous Decomposition Products: None

SPILL OR LEAKAGE PROCEDURES:
- Steps to be taken if material is released or spilled: Scoop up excess and place in a closed container. Scrub area well to reduce slipperiness.
- Waste disposal method: According to local, state, or federal ordinances. Not a hazardous or reglated waste.

SPECIAL PROTECTION INFORMATION:
- Ventilation: No special ventilation required.
- Respiration Protection: None required.
- Eye Protection: None required
- Protective Gloves: None required
- Other Protective Equipment: None required.

SPECIAL PRECAUTIONS.
- Precautions to be taken in handling and storage: Store in closed container in a dry place. Wash thoroughly after handling.
KEEP OUT OF REACH OF CHILDREN.
- Other precautions: None

HAZARD RATING:

Health:	0	0 = Minimal	3 = Serious
Fire:	0	1 = Slight	4 = Severe
Reactivity:	0	2 = Moderate	

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MATERIAL SAFETY DATA SHEET

SAFEGARD 5022A

MSDS # 020641

SECTION I

Manufacturer

Sanchem Inc
1600 S. Canal St.
Chicago, IL 60616
312-733-6100

TSCA Status
Components listed.
CAS Number: Mixture.

Transportation Emergency Telephone
CHEMTREC: (800) 424-9300

Formula
Mixture.

SECTION II – HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

None in reportable quantities per OSHA 1910.1200. See Section VI and X.

SECTION III – PHYSICAL/CHEMICAL CHARACTERISTICS (Typical data, not specifications)

Boiling Point
212°F (100°C)

Freeze Point
32°F (0°C)

Specific Gravity ($H_2O=1$)
1.0-1.2

Solubility in Water
Soluble in alkaline water.

% Volatile by Weight
57-66% water

Vapor Density (Air = 1)
water: 0.63

Vapor Pressure
Water: 17

pH
5-8

Appearance and Ocor
Hazy or while milky liquid.
Slight acrylate odor.

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MSDS # 014258

KANO LABORATORIES, INC.
SAFETY DATA SHEET

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Manufacturer: Kano Laboratories, Inc.
1000 E. Thompson Lane
Nashville, TN 37211
Information Phone Number: (615) 833-4101
Fax: (615) 833-5790 **Emergency:** 800-424-9300 (Chemtrec)
Website: www.kanolaboratories.com

HMIS Hazard Rating

HEALTH	1
FLAMMABILITY	2
REACTIVITY	0
PERSONAL PROTECTION	X

Product Name: KROIL
MSDS Date of Preparation: 6/7/05
Product Use: Penetrant/Lubricant for Industrial Use

SECTION 2: HAZARDS IDENTIFICATION

Slightly reddish liquid with a refreshing odor.

EMERGENCY OVERVIEW

WARNING! Combustible Liquid and Vapor. May cause eye and skin irritation. May be harmful if absorbed through the skin. Inhalation of vapors or mist may cause respiratory irritation and central nervous system effects such as headache, dizziness, nausea and vomiting. Harmful or fatal if swallowed. Aspiration into the lungs during ingestion or vomiting may cause lung damage. May cause chronic effects.

Potential Health Effects:

Eye: May cause eye irritation with redness, tearing and stinging. Corneal injury is possible if not promptly removed.

Skin: May cause mild irritation with redness, rash, swelling. Prolonged or repeated contact may result in defatting and dermatitis. May be absorbed through the skin with effects similar to inhalation and ingestion.

Inhalation: Inhalation of vapors or mists may cause mucous membrane and upper respiratory tract irritation and central nervous system depression. Symptoms may include burning sensation, coughing, wheezing, sore throat, shortness of breath, headache, dizziness, drowsiness, nausea, vomiting, depressed respiration and heart rate, heart rhythm irregularities and unconsciousness.

Ingestion: Swallowing may cause gastrointestinal irritation with abdominal pain, nausea, vomiting and diarrhea and central nervous system depression with symptoms including headache, dizziness, intoxication, weakness, respiratory failure, convulsions, cardiovascular collapse and pulmonary edema. Aspiration into the lungs during ingestion or vomiting may cause lung damage.

Chronic Hazards: Prolonged or repeated exposure may cause damage to the central nervous system, blood, kidney and liver. This product contains chemicals that in animal studies caused harm to the developing fetus, but only at exposure levels that harm the pregnant animal. There is no evidence of adverse fetal or reproductive effects in humans.

Carcinogen Status: None of the components of this product at greater than 0.1% are listed as carcinogens by OSHA, IARC or NTP.

Medical Conditions Aggravated by Exposure: Pre-existing eye, skin, respiratory, heart, central nervous system, liver and kidney disorders.

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MSDS # 012664B

WD-40

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Manufacturer:	WD-40 Company	Telephone:	
		Emergency only:	1-(800) 424-9300 (CHEMTREC)
Address:	1061 Cudahy Place (92110)	Information:	(619) 275-1400
	P.O. Box 80607	Chemical Name:	Organic Mixture
	San Diego, California	Trade Name:	WD-40 Aerosol
	92138-0607		

II. HAZARDOUS INGREDIENTS

Chemical Name	CAS Number	%	Exposure Limit ACGIH/OSHA
Aliphatic Petroleum Distillates	8052-41-3	45-50	100 ppm PEL
Petroleum Base Oil	64742-65-0	15-25	5 mg/M^3 TWA (mist)
LVP Hydrocarbon Fluid	64742-47-8	12-18	1200 mg/M^3 TWA
Carbon Dioxide	124-38-9	2-3	5000 ppm PEL
Non-hazardous Ingredients		‹ 10	

III. PHYSICAL DATA

Boiling Point:	323°F (minimum)	Evaporation Rate:	Not determined
Vapor Density (air=1):	Greater than 1	Vapor Pressure:	110 ±5 PSI @ 70°F
Solubility in Water:	insoluble	Appearance:	Light amber
Specific Gravity (H_2O=1):	0.817 @ 72°F	Odor:	Characteristic odor
Percent Volatile (volume):	74%	VOC:	412 grams/liter (49.5%)

IV. FIRE AND EXPLOSION

Flash Point:	131°F Tag Closed Cup
Flammable Limits:	(Solvent Portion) [Lel] 1.0% [Uel] 6.0%
Extinguishing Media:	CO_2, Dry Chemical, Foam.
Special Fire Fighting Procedures:	Contents Under Pressure
Unusual Fire and Explosion Hazards:	FLAMMABLE - U.F.C. level 3 AEROSOL

V. HEALTH HAZARD / ROUTE(S) OF ENTRY

Threshold Limit Value	Aliphatic Petroleum Distillates (Stoddard Solvent) lowest TLV (ACGIH 100 ppm.)
Symptoms of Overexposure	
Inhalation (Breathing):	May cause anesthesia, headache, dizziness, nausea and upper respiratory irritation.
Skin contact:	May cause drying of skin and/or irritation.
Eye contact	May cause irritation, tearing and redness.
Ingestion (Swallowed):	May caused irritation, nausea, vomiting and diarrhea.
First Aid Emergency Procedures	
Ingestion (Swallowed):	Do not induce vomiting, seek medical attention.
Eye Contact:	Immediately flush eyes with large amounts of water for 15 minutes.
Skin Contact:	Wash with soap and water.
Inhalation (Breathing):	Remove to fresh air. Give artificial respiration if necessary. If breathing is difficult, give oxygen.
	Pre-existing medical conditions such as eye, skin and respiratory disorders may be aggravated by exposure.
DANGER!	
Aspiration Hazard:	If swallowed, can enter lungs and may cause chemical pneumonitis. Do not induce vomiting. Call Physician immediately.
Suspected Cancer Agent Yes___ No_X_	The components in this mixture have been found to be noncarcinogenic by NTP, IARC and OSHA

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MATERIAL SAFETY DATA SHEET: SIMPLE GREEN®

also for : SIMPLE GREEN® SCRUBBING PAD

I. PRODUCT & COMPANY INFORMATION

Version No. 10012
Issue Date: January 2006

PRODUCT NAME: SIMPLE GREEN® ALL-PURPOSE CLEANER
SIMPLE GREEN® CONCENTRATED CLEANER / DEGREASER / DEODORIZER
SIMPLE GREEN® SCRUBBING PAD

MSDS # 012261

COMPANY NAME: SUNSHINE MAKERS, INC.
15922 Pacific Coast Highway
Huntington Harbour, CA 92649 USA
Telephone: 800-228-0709 • 562-795-6000
Fax: 562-592-3034
Website: www.simplegreen.com

For 24-hour emergency, call Chem-Tel, Inc.: 800-255-3924

USE OF PRODUCT: An all purpose cleaner and degreaser used diluted in water for direct, spray, and dip tank procedures. (Scrubbing pad is used with water for manual scrubbing applications.)

II. INGREDIENT INFORMATION

The only ingredient of Simple Green® with established exposure limits is undiluted 2-butoxyethanol (<6%) (Butyl Cellosolve; CAS No. 111-76-2): the ACGIH TLV-TWA is 20 ppm (97 mg/m^3).

Based upon chemical analysis, Simple Green® contains no known EPA priority pollutants, heavy metals, or chemicals listed under RCRA, CERCLA, or CWA. Analysis by TCLP (Toxicity Characteristic Leaching Procedure) according to RCRA revealed no toxic organic or inorganic constituents.

All components of Simple Green® are listed on the TSCA Chemical Substance Inventory.

III. HAZARDS IDENTIFICATION

UN Number: Not required
Dangerous Goods Class: Nonhazardous

NJ TRADE SECRET REGISTRATION NUMBERS	
80100235-5000p	80100235-5005p
80100235-5001p	80100235-5006p
80100235-5002p	80100235-5007p
80100235-5003p	80100235-5008p
80100235-5004p	80100235-5009p

Hazard Rating (NFPA/HMIS)
Health = 1* Reactivity = 0
Fire = 0 Special = 0

Rating Scale
0 = minimal 1 = slight
2 = moderate 3 = serious
4 = severe

*Mild eye irritant, non-mutagenic and non-carcinogenic. **None of the ingredients in Simple Green® are regulated or listed as cancer agents by Federal OSHA, NTP, or IARC.**

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MSDS # 021537

DOW CORNING

DOW CORNING CORPORATION
Material Safety Data Sheet

DOW CORNING 200(R) FLUID, 20 CST.

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

Dow Corning Corporation
South Saginaw Road
Midland, Michigan 48686

24 Hour Emergency Telephone: (989) 496-5900
Customer Service: (989) 496-6000
Product Disposal Information: (989) 496-6315
CHEMTREC: (800) 424-9300

MSDS No.: 01013173 Revision Date: 2002/05/01

Generic Description: Silicone
Physical Form: Liquid
Color: Colorless
Odor: Odorless

NFPA Profile: Health 0 Flammability 1 Instability/Reactivity 0

Note: NFPA = National Fire Protection Association

2. OSHA HAZARDOUS COMPONENTS

None present. This is not a hazardous material as defined in the OSHA Hazard Communication Standard.

3. EFFECTS OF OVEREXPOSURE

Acute Effects

Eye: Direct contact may cause temporary redness and discomfort.

Skin: No significant irritation expected from a single short-term exposure.

Inhalation: No significant effects expected from a single short-term exposure.

Oral: Low ingestion hazard in normal use.

Prolonged/Repeated Exposure Effects

Skin: No known applicable information.

Inhalation: No known applicable information.

Oral: No known applicable information.

Signs and Symptoms of Overexposure

No known applicable information.

Medical Conditions Aggravated by Exposure

No known applicable information.

The above listed potential effects of overexposure are based on actual data, results of studies performed upon similar compositions, component data and/or expert review of the product. Please refer to Section 11 for the detailed toxicology information.

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MSDS # 010835

DOW CORNING

DOW CORNING CORPORATION
Material Safety Data Sheet

DOW CORNING 200(R) FLUID, 100 CST.

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

Dow Corning Corporation
South Saginaw Road
Midland, Michigan 48686

24 Hour Emergency Telephone: (989) 496-5900
Customer Service: (989) 496-6000
Product Disposal Information: (989) 496-6315
CHEMTREC: (800) 424-9300

MSDS No.: 02638941 Revision Date: 2002/03/12

Generic Description: Silicone
Physical Form: Liquid
Color: Colorless
Odor: Characteristic odor

NFPA Profile: Health 0 Flammability 1 Instability/Reactivity 0

Note: NFPA = National Fire Protection Association

2. OSHA HAZARDOUS COMPONENTS

None present. This is not a hazardous material as defined in the OSHA Hazard Communication Standard.

3. EFFECTS OF OVEREXPOSURE

Acute Effects

Eye: Direct contact may cause temporary redness and discomfort.

Skin: No significant irritation expected from a single short-term exposure.

Inhalation: No significant effects expected from a single short-term exposure.

Oral: Low ingestion hazard in normal use.

Prolonged/Repeated Exposure Effects

Skin: No known applicable information.

Inhalation: No known applicable information.

Oral: No known applicable information.

Signs and Symptoms of Overexposure

No known applicable information.

Medical Conditions Aggravated by Exposure

No known applicable information.

The above listed potential effects of overexposure are based on actual data, results of studies performed upon similar compositions, component data and/or expert review of the product. Please refer to Section 11 for the detailed toxicology information.

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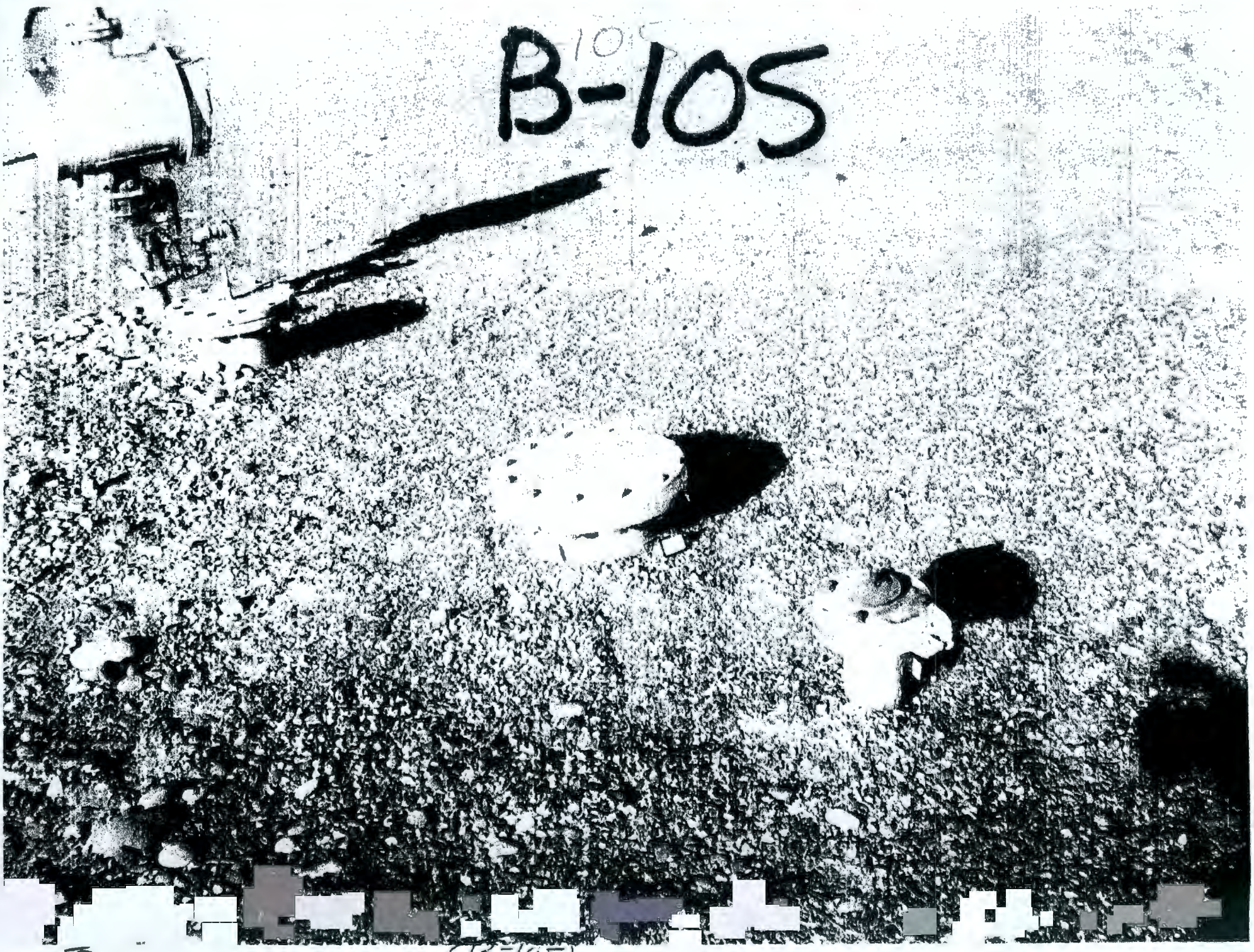
B-103


B-105
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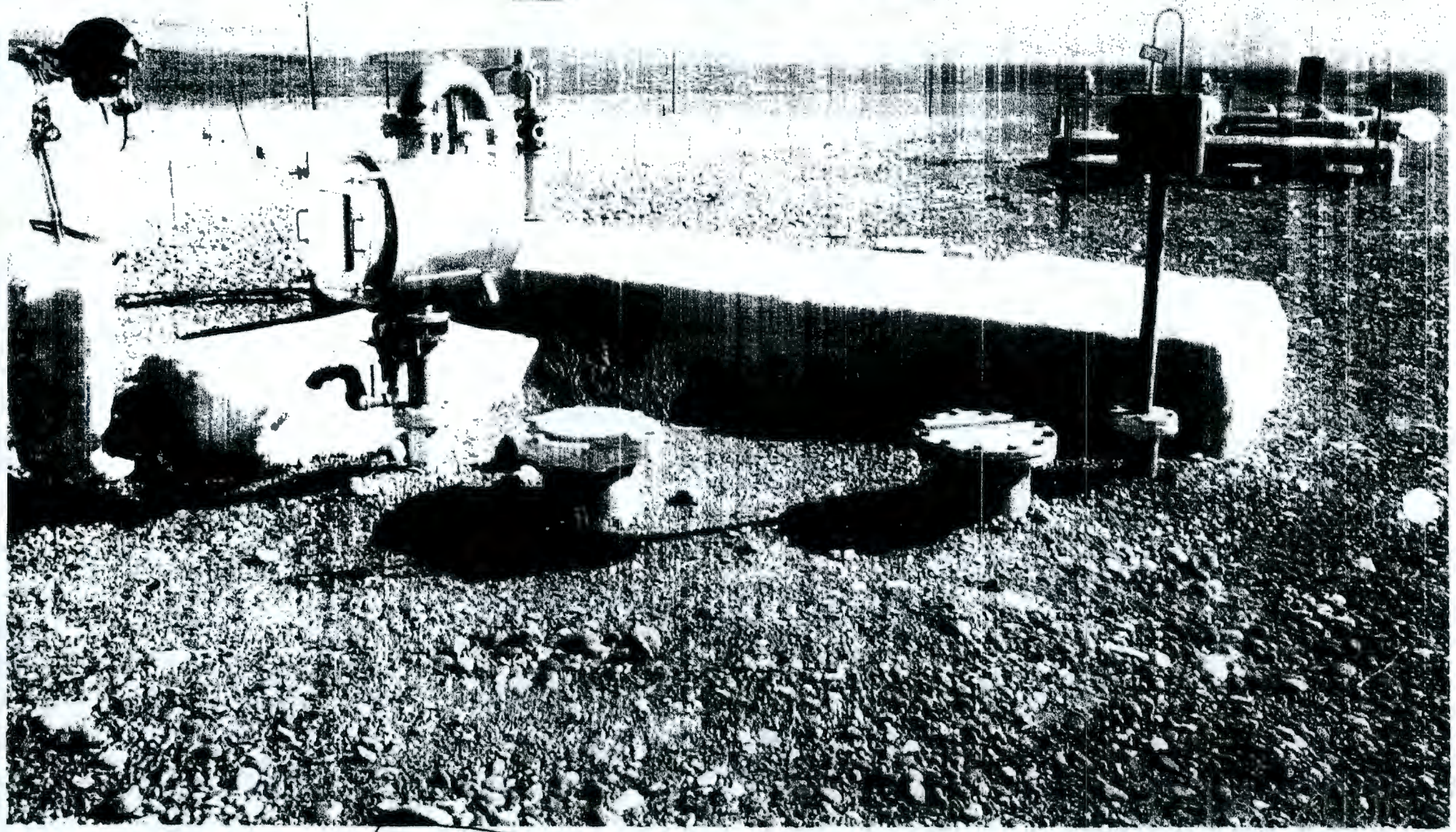
(13-105)

B-203



B-203

R STANDARD MATERIAL,
D SEAL HEPA FILTER
) WITH INLET AND OUTLET
)L TEST PORT AND
S SHALL BE REINFORCED

JIREMENTS, AND SHALL BE
G-OUT DESIGN FEATURES.
ND 11 GAUGE TYPE 304
ION OF THE HOUSINGS.
: NEGATIVE PRESSURE OF
LID TYPE DOOR ARRANGEMENT
)NS SHALL BE
CONNECTION SIZES ARE
SHALL BE SLIP ON TYPE, 150#
OVIDED WITH DOP INJECTION
WITH CAP.

R HOUSINGS SHALL
RIMETER CHANNEL ON THE
RANGMENT.
TH AN ALIGNMENT GAGE FOR
IRE THAT THE FILTER IS
THE HOUSING SHALL SECURE
TYPE 304 STAINLESS STEEL
ONE DIRECTION ONLY AND
AL FORCE ON THE FILTER

/OT AWAY FROM THE BAG-OUT
-OUT PROCESS. THE INLET
NNECTIONS, AND WITH AIRFLOW
E PLATE TO ALLOW UNIFORM

EAL WELD. AS A MINIMUM,
. HEAT DISCOLORATIONS,
N OF ANY GASKET SEALING
E.

FIED IN ACCORDANCE WITH
WELDS SHALL BE VISUALLY
NUFACTURER'S EQUIVALENT

ILTER ACCESS PORT.
SECURE THE PVC CHANGE
T THE BAG FROM TEARING.
AVING AN EXTRUDED NEOPRENE
D.

OUT BAG FOR THE FILTER
CK WITH A TRANSLUCENT
R. FOR VISIBILITY DURING
NSPARENT PVC AT THE MOUTH.
LING OF THE FILTER DURING
MED INTO THE MOUTH OF THE
RING. TO PREVENT THE CHANGE
ATION, ONE NYLON SECURITY

NCE PROGRAM THAT MEETS
: TESTED FOR FILTER FIT,
AND LEAK TIGHTNESS BY THE
IRMED", AND THE TEST REPORT
RATE OF 0.0005 CFM PER CUBIC
URFACE. ADDITIONALLY, THERE
HOUSING VOLUME AT 10 INCHES

57) WITH 316 SST BODY AND DISC AND
SILIENT SEAT SHALL BE BUNA-N*
VALVE SHALL BE FURNISHED
AND SHALL BE GIVEN A SHELL
OF TEST PROCEDURE(S) AND

316 SST BODY AND DISC, AND
SILIENT SEAT SHALL BE BUNA-N*
VALVE SHALL HAVE A HANDLE.
SHELL AND CLOSURE TEST
E(S) AND TEST RESULTS SHALL

TORQUE VALUES

FOR FABRICATION ASSEMBLY USE TORQUE VALUES SPECIFIED IN 2-MISC-049 TABLE 3

FOR INSTALLATION OF ASSEMBLY ON TANK RISERS USE TORQUE VALUES SPECIFIED IN 2-MISC-049 TABLE 7

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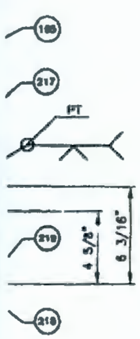
PIPING
AIR FILTER INSTALLA

																										170	DELETED	
			1	1	1															1						171	VALVE, BUTTERFLY, 4" SST, CLASS 150	SEE SHEET 10
			3		5															5						172	GASKET, 4" X 1/8" THK FOR 4" 150# FLANGE, COMPRESSED FIBER NON ASBESTOS	GARLOCK "BLUE G 3,000
																				1						173	FLANGE, BLIND, 4", 150# RF	ASTM A182 GR F
											1				1	1				1					1	174	BRACKET, 11 GAUGE	ASTM A240 304/3
						1											1									175	ELBOW, 45°, 4", SCH 40S	ASTM A403 WP304
															X											176	BREATHER FILTER ASSY – 12" X 12" X 6"	SHT 11
														X	1	1										177	FILTER CAN VENT SUB ASSY	SHT 12
													X		1	1										178	45° ELBOW SUB ASSY, 9" RADIUS	SHT 12
												X			1	1										179	WYE RISER SUB ASSY	SHT 12
											2				2	2				2					2	180	FITTING, 1/8" MALE NPT TO 1/4" TUBE	SWAGELOCK, SS-4
												AR														181	PIPE, 12" SCH 40S	ASTM A312 304L/3
												2														182	FLANGE, 12" SO, 150# RF	ASTM A182 GR F 3
				24	24										24	12										183	BOLT, HVY HEX HD 7/8"-9UNC-2A X 4 1/4"LG	ASTM A193 GR B8
				24	24										24	24										184	NUT, HVY HEX 7/8"-9UNC-2B	ASTM A194 GR 8
																			1							185	180° RETURN, 4" LR, SCH 40S	ASTM A403 WP304L
												1														186	INT RELIEF BRANCH CONN. WELDOLET 12" X 1 1/2" SCH 40S, STAINLESS STEEL STD	ASTM A182 GR F 3
	1																1									187	INT RELIEF BRANCH CONN. WELDOLET 4" X 1 1/2" SCH 40S, STAINLESS STEEL STD	ASTM A182 GR F 3
				2	2										2	2										188	GASKET, 12" X 1/8" THK FOR 12" 150# FLANGE, COMPRESSED FIBER NON ASBESTOS	GARLOCK "BLUE GA 3,000
				1	1										1	1										189	FLANGE, BLIND, 12", 150# RF	ASTM A182 GR F 3
																										190	NUT, WINGED 3/8"-16UNC WASHER, LOCK SPRING 3/8" (OPTIONAL)	ANY GRADE SST ANY GRADE SST
																										191	GASKET, 20" X 1/8" THK FOR 20" 150# FLANGE, COMPRESSED FIBER NON ASBESTOS	GARLOCK "BLUE GA 3,000
				1	1						1				1	1									1	192	VALVE, BUTTERFLY, 8" SST	SEE SHEET 10
											16				16	16									16	193	BOLT, HVY HEX HD (FOR ITEM #157) 3/4"-10UNC-2A X 2 1/4"LG	ASTM A193-B8 304
											16				16	16									16	194	WASHER, LOCK SPRING (FOR ITEM #157) 3/4" DIA	ANY GRADE SST
											1															195	DELETED	
			8	8	8															8						196	BOLT, HVY HEX HD (FOR ITEM #171) 5/8"-11UNC-2A X 2"LG	ASTM A193 GR B8
																										197	DELETED	
											2				2	2				2					2	198	SETSCREW, 10-24UNC-2A X 1/2"LG	ANY GRADE SST
											X															199	BREATHER FILTER ASSY – 6" X 6" X 6" (STRAIGHT)	SEE SHEET 16
										X	1															200	WYE RISER SUB ASSY – 6" X 6" X 6" (STRAIGHT)	SEE SHEET 16
			8	8	8															8						201	BOLT, HVY HEX HD (FOR ITEM #171) 5/8"-11UNC-2A X 1 3/4"LG	ASTM A193 GR B8
															2	2									2	202	ALL THREAD (FOR ITEM #192) 3/4"-10UNC-2A X 6"LG	ASTM A193 B8 CLAS
									X																	203	PIPE SPOOL ASSEMBLY	SEE SHEET 14,
									1																	204	PIPE, 4" SCHED 40 X 1'-5" L	ASTM A312 TP 304 OR 304L
29.			1	1																						205	FLANDERS 40 CFM ROUND HEPA FILTER AND WEATHER COVER	SEE SHEET 18

(PARTS LIST CONTINUED ON SHEET 16)



HANFORD RELEASE
AUG 10 2006

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241-U 200 SERIES RETRIEVAL

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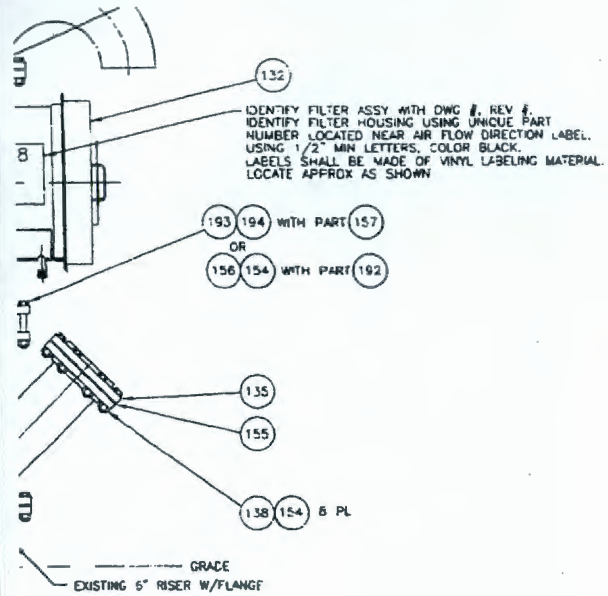
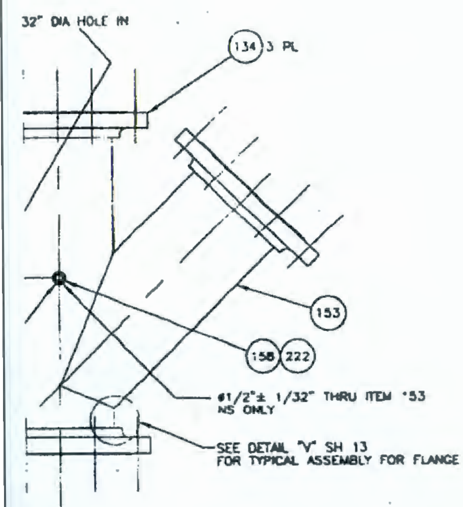
AIR FILTER
ASSEMBLY



6" X 6" X 6" (STRAIGHT)

1"



- 6" X 6" X 6" (STRAIGHT)

" = 1"

																														THK COMPRESSED SYNTHETIC FIBER NON-ASBESTOS (24" FLG, CL 150- FLAT RING TYPE)	
																			12										209	BOLT, HEX OR HEAVY HEX HEAD, 7/8"-9UNC-2A X 2-1/4" LG	ASTM A193 GR (OR ALT ASTM
																													210	NOT USED	
																			12										211	STUD, 7/8"-9UNC-2A X 4" LG	ASTM A193 GR B7 OR B
																				1					1				212	BALL VALVE, 1-1/2" FNPT, SST	SWAGELOK (W SS-67TF24
																		2	2				2					2	213	PLUG, 1/2" THD	ASTM A105 C
																		2	2				2					2	214	FITTING, 1/4" MALE NPT TO 1/4" TUBE	SWAGELOK SS-400-1-4
											X																		215	ASSEMBLY, PIPE SPOOL	
											1																		216	PIPE PLUG, 1" HEX HEAD, THD	ASTM A182 TI
											1																		217	HALF COUPLING, CLASS 3000 1"ø, NPT	ASTM A182 G
											1																		218	STUB END, SCH 40 4"ø, STYLE ASA-A	ASTM A403 3
											1																		219	FLANGE, BACK UP, 4"ø, 150#	ASTM A403 3
						1																							220	PIPE, 4" SCH 40, x 2'-6"L	ASTM A312 TF
						1																							221	PIPE, 4" SCH 40, x 4-1/4"L	ASTM A312 TF
																							1						222	PIPE PLUG, 1/2", HEX HEAD, THD	ASTM A182 TF
										X																			223	4" 40CFM FILTER MOUNTING FLANGE SUB ASSEMBLY	SEE SHEET 17
									X																				224	45° REDUCING ELBOW SUB ASSY.	SEE SHEET 17
								X	1						1							1							225	12"x12"x4" BREATHER FILTER ASSY.	SEE SHEET 17
							X		1	1					1														226	12"x12"x4" 40CFM BREATHER FILTER ASSY.	SEE SHEET 17
						X	1																						227	CT 40 CFM BREATHER FILTER ASSEMBLY	SEE SHEET 19
					1																								228	EXPANDED METAL 1/2" No 16 OR No 18 STAINLESS	ASTM A240 G ASTM A1267,
					X	1	1																						229	40 CFM BREATHER FILTER BIRD SCREEN	SEE SHEET 19
				X																									230	WYE ASSEMBLY 4x4x4 FABRICATED	SEE SHEET 12
			X																										231	WYE ASSEMBLY 5x6x6 FABRICATED	SEE SHEET 12
		X																											232	6" 40CFM FILTER MOUNTING FLANGE ADAPTER ASSEMBLY	SEE SHEET 17
	X																												233	FLANGE, 20" BLIND, RF, CLASS 150 (ALTERED)	ASTM A182 ANY SEE SHEET 13
X																													234	FLANGE, 20" RFSO, CLASS 150 (ALTERED) HALVED, CUT TOLERANCE: 1/16"	ASTM A182 ANY SEE SHEET 13
																			20										235	BOLT, HEX OR HEAVY HEX HEAD, 1-1/8"-7UNC-2A X 5-1/2" LG	ASTM A193 GR (OR ALT ASTM A
																			70										236	NUT, HEX OR HEAVY HEX, 1-1/8"-7UNC-2B	ASTM A194 GR (OR ALT ASTM A
																													237	40 CFM BREATHER FILTER ASSY. FOR EXISTING 4"-150lbs. FLANGES	SEE SHEET 17
																													238	4"x4"x4" 40CFM BREATHER FILTER ASSY.	SEE SHEET 17
						X	1																						239	241-AZ-154 MOUNTING DETAIL	SEE SHEET 19
						X	1																						240	241-U-301B MOUNTING DETAIL	SEE SHEET 19
																													241	NOT USED	

FOR PARTS LIST AND GENERAL NC
SEE SHT'S 9 & 10

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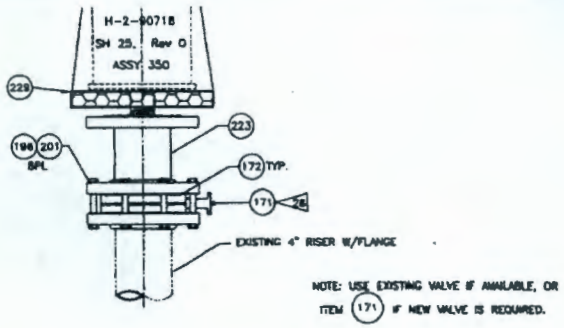
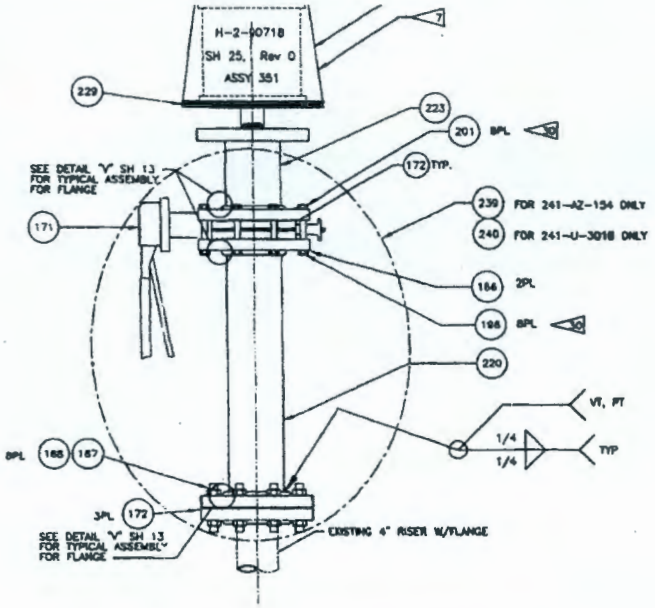


350 40 CFM BREATHER FILTER ASSY. W/4" VALVE FOR EXISTING 4"–150# FLANGES

SCALE: NONE



351 40 CFM BREATHER FILTER ASSY. W/4" VALVE FOR REPLACING G-1 OR OPEN FACE HEPA FILTER ASSY.

SCALE: NONE

SSY. NGES R ASSY.	ITEM NO	350 40 CFM BREATHER FILTER ASSY. W/4" VALVE FOR EXISTING 4"–150# FLANGES USING LUGGED BODY BUTTERFLY VALVE QUANTITY	ITEM NO	351 40 CFM BREATHER FILTER ASSY. W/4" VALVE FOR REPLACING G-1 OR OPEN FACE HEPA FILTER ASSY. USING LUGGED BODY BUTTERFLY VALVE QUANTITY	ITEM NO
	190	1	190	1	190
	205	1	205	1	205
	229	1	229	1	229
	223	1	223	1	223
	168	8	196	8	196
	167				
	172	2	172	3	172
		1	171	1	171
				1	220
				8	167
				8	168
		8	201	8	201
				2	166

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