U.S. Department of Energy
Office of River Protection
P.O. Box 450
Richland, Washington 99352

03-ESQ-030

MAY 16 2003

Mr. E. S. Aromi, President
and General Manager
CH2M HILL Hanford Group, Inc.
Richland, Washington 99352

Dear Mr. Aromi:

CONTRACT NO. DE-AC27-99RL14047 - CH2M HILL HANFORD GROUP, INC. (CHG) CONTAMINATION CONTROL PROGRAM, ASSESSMENT REPORT A-03-RADCON-TANKFARM-002, APRIL 14 THROUGH 18, 2003

This letter forwards the results of the subject assessment. The assessment team concluded CHG was implementing the Contamination Control Program according to the requirements of Title 10 Code of Federal Regulations Part 835. One Finding and five Observations were noted. The Enclosure documents the assessment details.

The Finding dealt with inadequate engineering controls to prevent contamination spread from the 244-A Lift Station, a condition inconsistent with the As Low As Reasonably Achievable principle.

The Positive Observation noted the correct response by a change trailer Operator to a challenge of the operator's radiological control knowledge. Observations for improvement included varying quality of radiological status maps in the change trailers; delay of radiological work due to a Radiological Work Permit error; lack of dedicated staff to maintain Fixed Contamination Area records in their current form; and inadequate labeling of used protective clothing receptacles in the change trailers.

By July 1, 2003, CHG shall provide a response to the Finding, including:

- Actions taken or planned to identify any similar Findings in other programs or activities.
- Evaluation of the underlying causes for each Finding.
- Actions taken or planned to correct the underlying cause(s) for each Finding.
- Actions planned to verify the effectiveness of the corrective actions.

While a written response is not required for an Observation, it represents an opportunity for CHG to improve its contamination control program.

When corrective actions for the Findings have been completed, please notify the U.S. Department of Energy, Office of River Protection.

If you have any questions, please contact me, or your staff may contact Larry McKay, Radiological Control Manager, (509) 376-7120.

Sincerely,

Roy J. Schepens
Manager

ESQ:LRM

Enclosure

cc w/encl:
E. E. Bickel, CHG
J. W. Hobbs, CHG
E. E. Kennedy, CHG
D. W. Roha, RL

Enclosure
03-ESQ-030
A-03-RADCON-TANKFARM-002

U.S. DEPARTMENT OF ENERGY
U.S. Department of Energy, Office of River Protection
Office of Environmental Safety and Quality

ASSESSMENT:	CH2M HILL Hanford Group, Inc. Contamination Control Program
REPORT NO.:	A-03-RADCON-TANKFARM-002
FACILITY:	Tank Farms
LOCATION:	Hanford Site
DATES:	April 14 – 18, 2003
ASSESSMENT TEAM:	L. R. McKay, U.S. Department of Energy, Office of River Protection (Assessment Lead) D. W. Roha, U.S. Department of Energy, Richland Operations Office

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EXECUTIVE SUMMARY

INTRODUCTION

The U.S. Department of Energy, Office of River Protection (ORP) assessment team (the team) evaluated the CH2M HILL Hanford Group, Inc. (CHG) Contamination Control Program for scope, adequacy, and compliance with Title 10 Code of Federal Regulations (CFR) Part 835 requirements.

FINDINGS, OBSERVATIONS, AND CONCLUSIONS

The team concluded that the CHG Contamination Control Program generally satisfied the requirements of 10 CFR 835, but the team identified the following Finding and five Observations:

Finding:

- Engineered controls were inadequate for controlling loose contamination release from the 244-A Lift Station (Finding A-03-RADCON-TANKFARM-002-F-01, Section 1.2).

Observations:

- The quality of radiological facility status maps in change trailers varied among farms (Observation A-03-RADCON-TANKFARM-002-O-01, Section 1.3).
- The ENRAF flush and calibrate work at AN Tank Farm was delayed approximately one day because the governing Radiological Work Permit did not include Radiological Buffer Areas, the designation of the work area (Observation A-03-RADCON-TANKFARM-002-O-02, Section 1.3).
- No single individual or group of individuals has been dedicated to maintaining Fixed Contamination Area records (Observation A-03-RADCON-TANKFARM-002-O-03, Section 1.3).
- Bags for receiving used protective clothing and waste were not labeled adequately as required by Tank Farm Radiological Control Manual Article 335.4.c (Observation A-03-RADCON-TANKFARM-002-O-04, Section 1.4).
- An operator manning the AN Change Trailer successfully responded to a challenge of his contamination control knowledge (Positive Observation A-03-RADCON-TANKFARM-002-PO-01, Section 1.4).

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A-03-RADCON-TANKFARM-002

CONTAMINATION CONTROL PROGRAM ASSESSMENT REPORT FOR THE PERIOD OF APRIL 14 THROUGH 18, 2003

1.0 REPORT DETAILS

1.1 Introduction

The assessment team (the team) evaluated the CH2M HILL Hanford Group, Inc. (CHG) implementation of the requirements of Title 10 Code of Federal Regulations Part 835, *Occupational Radiation Protection*, Subpart E, *Monitoring of Individuals and Areas*, Subpart F, *Entry Control Program*, and Subpart G, *Posting and Labeling*. The team limited its evaluation to contamination control in the workplace (control of environmental releases was outside the scope of the assessment).

The team based its conclusions on reviews of procedures and supporting documentation; observations of Radiological Control Technicians (RCTs) covering jobs; and interviews with managers, RCTs and other Radiological Workers for whom RCTs provided job coverage.

1.2 Engineered Contamination Controls

1.2.1 Assessment Scope

The team interviewed the Waste Feed Operations (WFO) Radiological Control (RadCon) Manager; RadCon Supervisors reporting to WFO RadCon Manager; RCTs; and a Support Health Physicist who served as a Radiological Work Planner. In addition, the team reviewed recent occurrences, critiques and post-job As Low As Reasonably Achievable (ALARA) reports relating to contamination control concerns.

1.2.2 Assessment Results

During the assessment, the team reviewed work in progress and interviewed WFO RadCon Organization staff. The team identified a current radiological issue concerning ongoing work at the 244-A Lift Station (Finding A-03-RADCON-TANKFARM-002-F-01). On April 10, 2003, loose radioactive contamination was spread outside the posted Contamination Area (CA) during work in a pit associated with the lift station, contrary to the requirements of Tank Farm Radiological Control Manual (TFRCM) Article 337, *Controlling the Spread of Contamination*:

> "The following measures shall [835.1102(a)] be used to prevent the spread of contamination across the boundary of Contamination Areas, High Contamination Areas and Airborne Radioactivity Areas:
>
> ...
>
> 4. Use engineering controls and containment devices such as glove bags, glove boxes and tents."

Further work in the pit was suspended while remedial actions were taken to restore the CA boundaries to their original locations and to decontaminate the affected area and equipment.

The work was being performed in the lift station fenced area, a posted CA, within an open-top "wind break" containment installed around the pit. During work, winds developed and blew loose contamination outside of the "wind break" containment, then outside of the posted CA fence boundary. A similar event, which occurred at this 244-A Lift Station in October 2000, resulted in a much more extensive spread of loose radioactive contamination and became a source of news media interest.

The team concluded that continued loss of control of radiological containment is the result of ineffective implementation of engineered controls for controlling loose radioactive contamination releases from the 244-A Lift Station. As a result, the lift station continues as a source for environmental release of loose radioactivity under certain conditions, e.g., strong wind. The open-top containment tent combined with the lack of adequate containment of loose radioactivity in the pit work area invited the escape of flaky contamination found in and around the pits and jumpers.

The team was concerned that continued releases are to becoming routine, without any planned corrective actions, noting that for a week after the event an in-process ALARA review had not been called, until the team prompted a manager to convene the review (conducted on April 18, 2003).

Loss of control of loose radioactive contamination has resulted in delays in production work as well as increased costs to recover from these events. At the time the team drafted this report, work had not yet restarted in the 224-A Lift Station. In addition, it appears that a rented trailer-mounted air compressor had been contaminated, resulting in reimbursement costs to the owner in addition to the costs for decontamination of the work areas to restore the CA boundaries. The team noted that a similar loss of containment incident occurred during work operations at AW-03A Pit on February 10, 2003.

The potential for internal deposition of radioactivity to personnel outside the posted areas also is a concern. Uncontrolled releases of loose radioactivity into the air potentially add radiation dose, an ALARA issue.

1.2.3 Conclusion

Finding A-03-RADCON-TANKFARM-002-F-01 **Engineered controls were inadequate for controlling loose contamination release from the 244-A Lift Station.**

1.3 Records

1.3.1 Assessment Scope

The team reviewed Waste Feed Operations (East Tank Farm) contamination control records for active and inactive jobs, including radiological facility status maps posted in change trailers, Radiological Work Permits (RWPs), completed and reviewed survey records, and supporting documentation.

1.3.2 Assessment Results

The team identified three areas for improvement.

1. The quality of radiological facility status maps in change trailers varied among farms. The radiological facility status map posted in AY-2 Change Trailer was complete and clearly legible; however, the AP Change Trailer radiological facility status map was incomplete and hard to read. Specifically, the AP map did not identify the CA located within the Farm and consisted of a faint copy of a survey form posted in a display case.

   A generic problem existed for all status maps: due to the design of the maps, the reader could not determine what information had been updated – the entire drawing or just portions of it. This did not appear to meet the requirement of TFC-ESHQ-RP_MON-P-10, Revision A-1, *Required Radiological Surveillances*, Paragraph 3.1.7, "... ensures posted status maps are maintained current and controlled to prevent inadvertent alterations."

   Maintenance of correct and clearly legible status maps is necessary to assure personnel are informed of current radiological conditions prior to entry and for ALARA purposes (Observation A-03-RADCON-TANKFARM-002-O-01).

2. The ENRAF flush and calibrate work at AN Tank Farm was delayed until the following day because to the governing RWP did not include Radiological Buffer Areas (RBA), the designation of the work area.

   The RCT covering this job recognized the problem but the entire job was suspended for approximately one day since RWP TF-001, Revision 21, was silent to RBAs (the work area was posted as an RBA). This RWP included CAs and Airborne Radioactivity Areas, but not RBAs.

   Inadequate procedure preplanning resulted in production delays and increased costs to correct deficiencies (Observation A-03-RADCON-TANKFARM-002-O-02).

3. No single individual or group of individuals has been dedicated to maintaining Fixed CA records. The team found the Fixed CA inventory and survey records were organized in 3-ring binders and of good quality. However, due to personnel reassignment following the CHG Mission Alignment Process, no one had been dedicated to maintaining these records in their current form, according to information received during interview with RCTs responsible for this work. Failure to adequately monitor fixed contamination areas could result in spread of loose contamination if fixed contamination is unknowingly disturbed (Observation A-03-RADCON-TANKFARM-002-O-03).

1.3.3 Conclusion

Observation A-03-RADCON-TANKFARM-002-O-01	The quality of radiological facility status maps in change trailers varied among farms.
Observation A-03-RADCON-TANKFARM-002-O-02	The ENRAF flush and calibrate work at AN Tank Farm was delayed approximately one day because the governing RWP did not include RBAs, the designation of the work area.
Observation A-03-RADCON-TANKFARM-002-O-03	No single individual or group of individuals has been dedicated to maintaining Fixed CA records.

1.4 Program Implementation

1.4.1 Assessment Scope

The team evaluated the effectiveness of the CHG Contamination Control Program as applied to day-to-day work in the Tank Farms. This involved observation of scheduled radiological work activities and a "ride along" with the "Car 33" RCT.

1.4.2 Assessment Results

The team identified one area of improvement:

- Bags for receiving used protective clothing waste were not adequately labeled in the AY-2 Change Trailer or at the CA posted inside the AP Tank Farm for SN-622 work, as required by TFRCM Article 335.4.c, "Labeled containers inside the area boundary for collection of protective clothing and equipment ...." In addition, discussions with a Radiological Worker and a RCT Supervisor provided conflicting opinions on how/whether containers needed to be marked. For example, in one case the response was no marking would be needed since "we know" where to put personal protective equipment and waste. In another case, the response was that cloth protective clothing should be separated from gloves and shoe covers. This requirement should be clarified with the laundry contractor and posted appropriately at the doffing stations. Correcting this ALARA issue would reduce personnel radiation dose and reduce the potential need to sort and repackage waste/protective clothing (Observation A-03-RADCON-TANKFARM-002-O-04).

- The team made a Positive Observation about the way in which the program had been implemented in the field: An operator manning the AN Change Trailer successfully responded to a challenge of his contamination control knowledge. Preparing to exit the RBA, a team member asked if he could perform a contamination survey of his own clipboard. The operator answered correctly and without hesitation that only an RCT could do that and sent for one to perform this task (Observation A-03-RADCON-TANKFARM-002-PO-01)

1.4.3 Conclusion

Observation A-03-RADCON-TANKFARM-002-O-04	Bags for receiving used protective clothing and waste were not labeled, as required by TFRCM Article 335.4.c.
Observation A-03-RADCON-TANKFARM-002-PO-01	An operator manning the AN Change Trailer successfully responded to a challenge of his contamination control knowledge.

2.0 PRESENTATION OF RESULTS TO CH2M HILL HANFORD GROUP, INC.

The team presented the assessment results to members of CHG RadCon management by means of a series of communications and the distribution a "factual accuracy review" draft of the report during April and May 2003. CHG acknowledged the findings, observations, and conclusions presented and committed to provide a written response to the Findings after the report is published.

3.0 REPORT BACKGROUND INFORMATION

3.1 Partial List of Persons Contacted

G. W. (Nick) Boyd, RCT
R. D. Brooks, RCT
D. L. Hagen, WFO Facility RadCon Supervisor
M. J. Kornish, WFO Support Health Physicist (Planner)
L. M. Livesey, ALARA Coordinator (Health Physicist)
J. M. McAuley, WFO Projects RadCon Supervisor
P. S. McElroy, Construction Field Lead
J. E. Miller, RCT (Routines Lead)
D. W. Pattee, WFO Surveillance RadCon Supervisor
W. Roberson, RCT
C. E. Upchurch, WFO RadCon Manager

3.2 List of Inspection Procedures Used

1. ORP PD 220.1-3, Revision 1, *ESQ Surveillances*, dated November 20, 2002.

3.3 List of Documents Reviewed

CHG RadCon Program Documents

2. HNF-5183, Revision 0, *Tank Farms Radiological Control Manual*, dated July 19, 2000.
3. HNF-MP-5184, Revision 2, *CH2M HILL Hanford Group, Inc. Radiation Protection Program*, dated March 21, 2000.
4. HNF-IP-0842, Volume 7, Section 16.2, Revision 0a, *Fixed Contamination Area*.
5. HNF-IP-0842, Volume 2, Section 4.6.3, Revision 2g, *Lessons Learned Procedure*.

CHG Contamination Control Program Documents

6. TCF-ESHQ-RP_MON-C-14, Revision B, *Contamination Area Controls*.
7. TCF-ESHQ-RP_ADM-P-09, Revision B, *Documentation of Radiological Surveys*.
8. TFC-ESHQ-RP_MON-C-23, Revision A, *Release Surveys For Material And Equipment*.
9. TFC-ESHQ-RP_MON-P-10, Revision A-1, *Required Radiological Surveillances*.
10. TFC-ESHQ-RP_RWP-C-03, Revision B, *ALARA Work Planning*.
11. Post Job ALARA Review Index, April 3, 2003.
12. EIT-2003-007, Event Investigation Report concerning Airborne Activity at AW-03A Pit.
13. TFC-A001, Scheduled Radiation Survey Task Description, Revision 3, dated September 29, 2002, *Survey of Fixed Contamination Areas*.
14. TFC-D007, Scheduled Radiation Survey Task Description, Revision 3, dated September 29, 2002, *Facility Contamination Area Access/Exit Points*.
15. East Tank Farms Fixed CA Logbook.

Other Records

16. Organization Chart for CHG Environmental, Safety, Health and Quality, dated March 27, 2003.
17. Post Job ALARA Review Index, April 14, 2003.

18. WFO Annual Routine Signoff sheet/Task Completion Record for fixed CAs, ending 2003.

19. TFC-ESHQ-QC-C-01, Revision A-3, *Problem Evaluation Request.*
20. *Tank Farm Contractor Radiological Survey Report,* WF 4.8.3, Weekly contamination survey of A Farm.

21. *Project Hanford Radiological Survey Report,* WF-000119, *Daily Survey of Facility CA Exit Paths and SOPs.*

22. Problem Evaluation Request 2003-1369, dated April 2, 2003.

23. Tank Farm Contractor ALARA Review, IPAAR-03-004, dated April 9, 2003.

24. Fact Finding Report, *224A Lift Station Contamination Release*, dated April 17, 2003.

25. EIT-2003-007, Event Investigation Report regarding "Airborne Activity at AW-03A Pit," dated February 10, 2003

3.4 List of Acronyms

ALARA	As Low As Reasonably Achievable
CA	Contamination Area
CHG	CH2M HILL Hanford Group, Inc.
ORP	Office of River Protection
PD	Procedure Directive
RadCon	Radiological Control
RBA	Radiological Buffer Area
RCT	Radiological Control Technician
RWP	Radiological Work Permit
SOP	Step-Off Pad
TFRCM	Tank Farm Radiological Control Manual
WFO	Waste Feed Operations

Task Detail Report 05/19/2003 07:16 AM

Task #: ORP-ESQ-2003-0027 - Closed (05/19/2003)

Parent Task #:
Subject: CONCUR:03-ESQ-030;CHG CONTAMINATION CONTROL PROGRAM, SURVEILLANCE REP
Category: None
Due Date:
Originator: Mosby, Debbie A

Reference #: 03-ESQ-030
Deliverable: None
Status: Closed
Priority: None
Originator Phone: (509)376-9106

Assigned By: Self
Assigned Role: Originator

Assigned Date: 05/08/2003
Assigned Due Date:

Routing Lists: ⊞ **Route List - Inactive**

- ☐ McKay, Larry R - Approve - Approve - 05/12/2003 09:42
- ☐ Barr, Robert C - Approve - Approve - 05/14/2003 14:34 (By: Hopkins, Dianne)
- ☐ Swailes, John H - Approve - Approve with comments - 05/14/2003 15:37 (By: Struthers, Deborah J)
- ☐ O'Connor, Judith S - Approve - Approve - 05/15/2003 09:43
- ☐ Erickson, Leif - Approve - Approve - 05/15/2003 14:56 (By: Deutsch, V Genie)
- ☐ Schepens, Roy J - Approve - Approve - 05/16/2003 14:48 (By: Poynor, Cathy D)

Instructions:
bcc:
ESQ OFF FILE
ESQ RDG FILE
MGR RDG FILE
R. C. BARR, ESQ
L. R. MCKAY, ESQ
J. S. O'CONNOR, OPA
C. J. BOSTED, TOD
M. C. BROWN, TOD
B. A. HARKINS, TOD
B. J. HARP, TOD
S. H. PFAFF, TOD
G. D. TRENCHARD, TOD
K. G. WADE, TOD
B. I. WILLIAMSON, TOD
D. L. NOYES, TPD

Attachments:
1. 03-ESQ-030.att.A-03-RADCON-CHG-002.doc
2. 03-ESQ-030.lrm.doc

Comments

Response Comments

Poster / Date : Swailes, John H (Struthers, Deborah J) - 2003-05-14 15:37:32
Subject : Struthers, Deborah J -- Approve
Steve wiegman signed for John Swailes 5/14/03

Task Due Date History:

Date Modified	Task Due Date	Modified By

-- End of Report --

Task Detail Report 05/08/2003 10:55 AM

Task #: ORP-ESQ-2003-0027

Parent Task #:
Subject: CONCUR:03-ESQ-030;CHG CONTAMINATION CONTROL PROGRAM, SURVEILLANCE REP
Category: None
Due Date:
Originator: Mosby, Debbie A

Reference #: 03-ESQ-030
Deliverable: None
Status: Open
Priority: None
Originator Phone: (509)376-9106

Assigned By: Self
Assigned Role: Originator

Assigned Date: 05/08/2003
Assigned Due Date:

Routing Lists: ⊞ **Route List - Active**

- ☐ McKay, Larry R - Approve - Awaiting Response LRM 5/12/03
- ☐ Barr, Robert C - Approve - Awaiting Response RCB 5/14/03
- ☐ Swailes, John H - Approve - Awaiting Response Sarah for JHS 5/14/03
- ☐ O'Connor, Judith S - Approve - Awaiting Response JSO 5/14/03
- ☐ Erickson, Leif - Approve - Awaiting Response [illegible] 6 / 15 May 2003
- ☐ Schepens, Roy J - Approve - Awaiting Response

Instructions:
bcc:
ESQ OFF FILE
ESQ RDG FILE
MGR RDG FILE
R. C. BARR, ESQ
L. R. MCKAY, ESQ
J. S. O'CONNOR, OPA
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S. H. PFAFF, TOD
G. D. TRENCHARD, TOD
K. G. WADE, TOD
B. I. WILLIAMSON, TOD
D. L. NOYES, TPD

Attachments:
1. 03-ESQ-030.att.S-03-RAD-TANKFARM-002 Report to Debbie 5-7-03.doc
2. 03-ESQ-030.lrm.doc

Comments

Task Due Date History:

Date Modified	Task Due Date	Modified By

-- End of Report --