Inspector General Hotline Case 97059/DIH 05-8278
U.S. Army Inspector General Agency
Technical Inspections Division

DoD Hotline Completion Report

8 December 2005

1. Names of Examining Official: (b)(7)(C)

2. Rank/Grades of Examining Official: (b)(7)(C)

3. Duty Position and Telephone Numbers of Examining Official:
Detailed Inspector General, (703) 601-11633

4. Organization of Examining Official:

HQDA, U.S. Army Inspector General
Agency, ATTN: SAIG-TI,
1700 Army Pentagon
Washington DC 20310

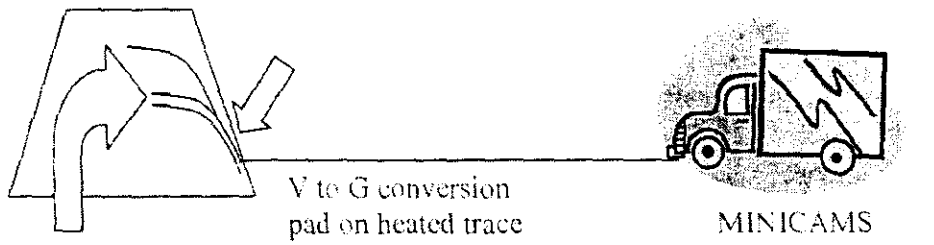
5. Hotline Control Number: 97059/DIH 05-8278

6. Scope of Examination:

a. Background:

(1) Summary of complaint:

(a) In September 2003, the Blue Grass Chemical Activity (BGCA) changed the Miniature Continuous Air Monitoring System (MINICAMS) agent monitoring configuration for nerve agent VX by removing the VX to G - analog conversion pads (hereafter referred to as V to G conversion pads) that were installed at the distal end (sampling point end) of the three unheated VX sampling lines located within the VX storage igloos. The V to G conversion pads are used to convert nerve agent VX vapor to a nerve agent G analog vapor that is more volatile and more readily detected by the MINICAMS. The V to G pad installed on the end of the heated trace line outside the igloo remained in place.

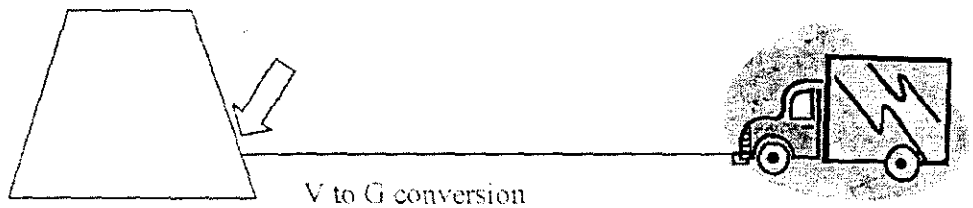


V to G conversion pads On 3 each sample lines within VX Igloos

V to G conversion pad on heated trace line outside igloo

MINICAMS (located within vehicle)

PRIOR TO CHANGE IN SEPTEMBER 2003



V to G conversion pad on heated trace line outside igloo

MINICAMS (located within vehicle)

POST SEPTEMBER 2003 CHANGE

(b) (b)(7)(C), a BGCA (b)(7)(C) complained that the MINICAMS sampling configuration change and poor air monitoring equipment maintenance caused incorrect air monitoring data results for agent VX. (b)(7)(C) complains that reliance on the incorrect VX air monitoring data to permit access to VX igloos jeopardized the lives and health of the workforce, risked release of VX agent to the environment, and resulted in incorrect air monitoring reports to the Kentucky Department for Environmental Protection and other agencies within and outside the Department of Army.

(c) (b)(7)(C) concerns stem from his attendance at a MINICAMS training course in February 2005 in Pelham, Alabama where the sampling configuration for VX in use at BGCA was discussed. The course was presented by the MINICAMS manufacturer, O.I. Analytical, CMS Field Products. The instructor (b)(7)(C) informed the students that he recommended against the setup used at BGCA with the V to G conversion pads installed only on the outside of the igloo because, based on his (b)(7)(C)

(b)(7)(C) experience, the setup would not work. Subsequently, (b)(7)(C) raised his (b)(7)(C) complaints to BGCA laboratory, Chemical Operations Division, and (b)(7)(C) personnel.

(3) The Public Employees for Environmental Responsibility (PEER), a Washington, DC based organization, sent a letter dated 24 August 2005, subject: Request for investigation and complaint of (b)(7)(C) to (b)(7)(C) (b)(7)(C) Pentagon, Washington, DC, on behalf of the complainant. In the letter, PEER states (b)(7)(C) requests:

(a) An inspection of air monitoring records maintained at the U.S. Army Blue-Grass Army Depot (BGAD) "focusing on whether the Depot has properly monitored and accurately reported the results of its monitoring of seven igloos that store munitions containing agent VX to Kentucky environmental officials and other agencies within and outside the Army."

(b) "A review to determine whether air monitoring components and equipment are properly changed out or maintained so to maximize monitoring capability."

(c) "An after-action review to determine the responsible official(s) who made decisions that compromised the efficacy of conversion pads to detect VX leaks."

(4) In its 24 August 2005 letter to the DoD Hotline, PEER stated it represented (b)(7)(C) (b)(7)(C) at the Blue-Grass Army Depot (BGAD)."

(5) Attached to the 24 August 2005 PEER letter was an affidavit signed by (b)(7)(C) (b)(7)(C) consisting of 25 statements supporting his concerns. Statements #1 through #5 inclusive were administrative in nature (name, job duties, etc.). In four of the statements (#21, #22, #23, and #24) (b)(7)(C) implies he is a victim of whistleblower retaliation. The four statements are not related to the specific requests in the PEER cover letter.

(6) The Hotline Case was referred for action to the Army Inspector General on 15 September 2005 and assigned to the Technical Inspections Division for Inquiry or Investigation on 16 September 2005. In a separate electronic mail, the DoDIG indicated the whistleblower allegations would be retained by DoDIG for action by the Office of Special Counsel.

(7) Preliminary analysis of the PEER cover letter and the remaining 21 affidavit statements identified the following:

(a) Although reference is made to the BGAD throughout the document, in most instances, the correct reference for the specific complaints should be to the BGCA, which is a tenant activity located on BGAD. Air monitoring of the VX igloos, air monitoring

equipment configuration and maintenance, and air monitoring record generation and record maintenance are the responsibilities of the BGCA. (b)(7)(C) works for BGCA.

(b)(7)(D)

(e) In Statement #3 of his affidavit, (b)(7)(C) (b)(7)(C) The acronym "RTAP" is the acronym for Real Time Analytical Platform. The MINICAMS are located within the RTAP vehicle.

(f) In Statement #6 of his affidavit, (b)(7)(C) (b)(7)(C) The blister munitions stored in the BGCA igloos contain H (levinstein mustard), not HD. However, HD standards (dilute HD) are used to challenge the MINICAMS. Standards are maintained in the BGCA non-surety laboratory or in the RTAPS.

(g) In Statement #8 of his affidavit, (b)(7)(C) (b)(7)(C) (b)(7)(C) For clarification purposes, note that the V to G conversion pads have always been installed at the distal end of the heated trace line. The action taken by BGCA on or about September 2003 was the removal of V to G conversion pads from the distal ends of the unheated sample lines within the VX igloos. Several BGCA employees providing testimony during this Investigative Inquiry also erroneously used terms implying the V to G conversion pads were moved from inside the igloos to outside the igloos. Standing operating procedures as well as records of MINICAMS quality check agent challenges indicate that V to G conversion pads have been installed at the distal

end of the heated trace line since the MINICAMS were utilized to monitor for VX (circa 1997).

(8) Preliminary analysis of the PEER letter and enclosed affidavit identified two allegations and six issues.

b. The following people were interviewed during this Investigative Inquiry.

(1) Complainant.

Name of Complainant: (b)(7)(C)
Grade of Complainant: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Complainant: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY on (b)(7)(C) (b)(7)(C) (b)(7)(C) Also present was the **did not agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

(2) Subjects.

Name of Subject: (b)(7)(C)
Grade of Subject: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Subject: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY, on (b)(7)(C) (b)(7)(C) **did not agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

The recalled testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY on (b)(7)(C) **did not agree** to the release of this recalled testimony outside official channels in accordance with the Freedom of Information Act.

Name of Subject: (b)(7)(C)
Grade of Subject: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Subject: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY on (b)(7)(C) (b)(7)(C) and (b)(7)(C) **did not agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

(3) Witnesses:

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY on (b)(7)(C) Also present was the (b)(7)(C) **did not agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Chemical Depot
Duty assignment of Witness: (b)(7)(C) Blue Grass Army Depot

The testimony of (b)(7)(C) was obtained in person in an interview at BGCA, Richmond, KY, on (b)(7)(C) (b)(7)(C) **did not agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: BGCA
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY on (b)(7)(C) and (b)(7)(C) **did not agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY, on (b)(7)(C) Also present was the (b)(7)(C)

(b)(7)(C) **did not agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained by telephone interview at BGCA, (b)(7)(C) (b)(7)(C) **did agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Army Depot
Duty assignment of Witness: (b)(7)(C)
(b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY, on (b)(7)(C) (b)(7)(C) **did not agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY on (b)(7)(C) **did not agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: (b)(7)(C)
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained by telephone interview at (b)(7)(C) (b)(7)(C), on (b)(7)(C) (b)(7)(C) **did not agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained by telephone interview at BGCA, Richmond, KY, on (b)(7)(C) (b)(7)(C) **did agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY, on (b)(7)(C) **did agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Army Depot
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY on (b)(7)(C) **did agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY, on (b)(7)(C) (b)(7)(C) **did not agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY, on (b)(7)(C) (b)(7)(C) **did agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: (b)(7)(C)
Duty assignment of Witness: (b)(7)(C) [IG Note: (b)(7)(C)

The testimony of (b)(7)(C) was obtained by telephone interview at Fort Belvoir, VA, and (b)(7)(C) on (b)(7)(C) by (b)(7)(C) **did agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY on (b)(7)(C) MPH, and (b)(7)(C) **did not agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY on (b)(7)(C) (b)(7)(C) **did agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY on (b)(7)(C) (b)(7)(C) **did not agree** to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

Name of Witness: (b)(7)(C)
Grade of Witness: (b)(7)(C)
Organization: Blue Grass Chemical Activity
Duty assignment of Witness: (b)(7)(C)

The testimony of (b)(7)(C) was obtained in person at BGCA, Richmond, KY on (b)(7)(C) (b)(7)(C) **did not** agree to the release of this testimony outside official channels in accordance with the Freedom of Information Act.

c. The following documents were reviewed by Inspector General during this Investigative Inquiry.

(1) Complainant's Letter: Public Employees for Environmental Responsibility (PEER), to (b)(7)(C) (b)(7)(C) Pentagon, Washington, DC, dated 24 August 2005. Re: Request for investigation and complaint of (b)(7)(C) and attached Affidavit of (b)(7)(C) (b)(7)(C)

(2) Standards:

(a) 29 Code of Federal Regulations 1910.1020(d), Occupational Safety and Health Administration, Department of Labor, Occupational Safety and Health Standards, Subpart Z, Toxic and Hazardous Substances, Access to Employee Exposure and Medical Records, 1 July 2005.

(b) AR 385-61, The Army Chemical Agent Safety Program, 12 October 2001.

(c) Blue Grass Army Depot Occupational Health Clinic Standing Operating Procedure for Medical Surveillance and Treatment for Nerve Agent Exposure or Potential Exposure, MCXM-PM-M, 20 January 2005.

(d) Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance (QA) Plan for Chemical Agent Air Monitoring, Revision 3, 1999.

(e) Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance (QA) Plan for Chemical Agent Air Monitoring, Revision 4, March 2003.

(f) Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance (QA) Plan for Chemical Agent Air Monitoring, Revision 5, November 2004, approved December 2004.

(g) Chemical Materials Agency Programmatic Monitoring Concept Plan, June 2004.

(h) DA Pamphlet 40-8, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX, 4 December 1990.

(i) DA Pamphlet 385-61, Toxic Chemical Agent Safety Standards, 27 March 2002.

(j) Department of Army Implementation Guidance Policy for Revised Airborne Exposure Limits for GB, GA, GD, GF, VX, H, HD, and HT, 18 June 2004.

(k) Field MINICAMS Maintenance Workbook, CMS Field Products, October 2004.

(l) Interim Guidance on Nerve Agent Decontamination and Medical Services in the Industrial Setting, 10 June 2003.

(m) Interim Guidance on Occupational Health Practices for the Evaluation and Control of Occupational Exposures to Nerve Agents GA, GB, GD, GF, and VX, 8 June 2004.

(n) Kentucky Administrative Regulations (KAR) Title 401, Natural Resources and Environmental Protection Cabinet, Department for Environmental Protections.

(o) Operation Manual for the Field MINICAMS, O.I. Analytical, CMS Field Products, October 2000.

d. Allegation 1. That (b)(7)(C) a Blue-Grass Chemical Activity (BGCA) (b)(7)(C) improperly ordered the removal of the Miniature Continuous Air Monitoring System (MINICAMS) V to G conversion pads from the distal ends of the unheated sample lines in violation of the Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance Plan, Revision 4, and Revision 5, dated March 2003, and approved 25 April 2003, and dated November 2004, and approved December 2005, respectively, and the U.S. Army Chemical Materials Agency Programmatic Monitoring Concept Plan, June 2004.

(1) Evidence:

(a) Standards:

1 Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance (QA) Plan for Chemical Agent Air Monitoring, Revision 3, 1999, did not contain instructions regarding the placement of the V to G conversion pads.

2 The O.I. Analytical Operation Manual for the Field MINICAMS, October 2000, does not contain instructions related to the use and location of V to G conversion pads.

3 Paragraph 8.1.1.1, page 47, of The Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance (QA) Plan for Chemical Agent Monitoring, Revision 4, dated March 2003, and approved 25 April 2003, stated that "VX pads shall be placed at the distal end of the sample line."

4 Paragraph 8.1.1.1, page 42, of the CASARM QA Plan for Chemical Agent Monitoring, Revision 5, dated November 2004, and approved December 2004, states that "VX pads shall be placed at the distal end of the sample line."

5 Table 5-1 with footnote "e", page 63, of the Chemical Materials Agency Monitoring Concept Plan, dated June 2004, requires the V to G conversion pads (AgF Pads) be placed at the distal end where distal end is defined as the point at which the sample enters the sample line or sample probe.

(b) Documentary Evidence:

1 Change 3 to Revision 2 of the Blue Grass Chemical Activity Monitoring Plan, dated 4 September 2003, removed the requirement for installing V to G conversion pads at the distal end of the VX sampling lines within the igloo. The Monitoring Plan approval page with signatures indicating review and approval of the change by the chain of command could not be located during this Investigative Inquiry.

2 In an electronic mail dated 25 August 2005, subject: VX Transmission, (b)(7)(C) (b)(7)(C) Blue Grass Chemical Activity, stated the attachment to the electronic mail: Southern Research Institute (SRI), Analytical Methods Development, Volume 1, Experimental Studies, 1985, pages 179-182, was the rationale the BGCA lab used to relocate the V to G conversion pads and that the gist of the attached was that VX vapor will be transmitted and detected through tubing without V to G conversion pads.

3 Southern Research Institute, Analytical Methods Development, Volume 1, Experimental Studies, 1985, pages 179-182, documented the average transfer efficiency of VX through 6-feet of Teflon tubing as 86%. The study was conducted with the Depot Area Air Monitoring System (DAAMS) air monitoring system. The study also included

the following caveats: tests were performed with clean, dry sample gas and clean dry Teflon tubing; transfer of VX vapor through Teflon tubing was markedly dependent upon the history of the tubing; transfer efficiency through two 12-foot lengths of tubing fell to 70% from greater than 90% after tubing was used to sample 5300 liters of laboratory air with 30 liters of generator effluent and to 40% when used to sample 960 liters of air near the exhaust of a diesel engine. Study recommended against sampling VX vapor solely through Teflon tubing.

4. In an electronic mail dated 23 February 2005, subject: (b)(7)(D)

(b)(7)(D)

(c) Testimonial Evidence:

1. (b)(7)(C) BGCA (b)(7)(C) stated in testimony recorded at BGCA on 13 October 2005:

(b)(7)(D)

(b)(7)(D)

2 (b)(7)(C) BGCA (b)(7)(C) stated in testimony recorded at BGCA on 11 October 2005 and 13 October 2005:

(b)(7)(D)

3 (b)(7)(C) BGCA (b)(7)(C) and the (b)(7)(C) in testimony recorded at BGCA on 11 October 2005, stated:

(b)(7)(D)

(b)(7)(D)

4 (b)(7)(C) BGCA (b)(7)(C) in testimony recorded at BGCA on 12 October 2005, stated:

(b)(7)(D)

5 (b)(7)(C) a BGCA (b)(7)(C), in testimony recorded at BGCA on 12 October 2005 stated:

(b)(7)(D)

(b)(7)(D)

6 (b)(7)(C) BGCA (b)(7)(C) in testimony obtained by telephone interview at BGCA on 13 October 2005 stated:

a That she attended the meeting at the Treaty Building on 24 February 2005 at which time (b)(7)(C) asked questions of (b)(7)(C) Because of his attending the MINICAM training class in Alabama, he found out from the instructor that in order for the VX to be pulled through and get any readings on the MINICAMS that it has to have the V to G conversion pads at the end of the sampling line, and that was not the way it was being done at Blue Grass.

b That (b)(7)(C) stated at the meeting that she had tried to call her counterparts at the Chemical Materials Agency (CMA) about this issue, but she had not been successful in getting them to agree with her decision.

7 (b)(7)(C) BGCA (b)(7)(C) (b)(7)(C) in testimony recorded on 11 October 2005 stated:

(b)(7)(D)

8 (b)(7)(C) BGCA (b)(7)(C) in testimony recorded at BGCA on 11 October 2005, stated:

(b)(7)(D)

9 (b)(7)(C) BGCA (b)(7)(C) and previous BGCA (b)(7)(C) in recorded testimony obtained by telephone at BGCA on 12 October 2005 stated he did not know how or why the conversion pads were removed from the inside of the igloos. That was decided by the (b)(7)(C)

10 (b)(7)(C) BGCA (b)(7)(C) in testimony recorded at BGCA on 13 October 2005, stated that the V to G conversion pads used to be inside the igloo, but because the pad would get damp, dusty, and dirty, you could not get the flow rate. So management made the decision to remove the pads from inside the igloo; he did not know who made the decision.

11 (b)(7)(C) BGCA (b)(7)(C) in testimony recorded on 12 October 2005 stated:

a There were two meetings when they got back from the course and they were talking about the V to G conversion pads.

b That (b)(7)(C) said that she had guidance to take them off and that (b)(7)(C) was told to bring this guidance to the next meeting. At the next meeting, (b)(7)(C) did not have the guidance with her. (b)(7)(C) said that she had a directive, a memo, or something that said she could take them off, but she produced nothing.

c That (b)(7)(C) is (b)(7)(C) supervisor and that he had asked (b)(7)(C) some questions as far as where the documentation was to take the V to G conversion pads out of the igloo and she did not have them.

12 (b)(7)(C) BGCA (b)(7)(C) (b)(7)(C) in testimony recorded at BGCA on 11 October 2005, stated:

(b)(7)(D)

13 (b)(7)(C) BGCA (b)(7)(C), in testimony recorded on 11 October 2005 stated:

a In the past we had the V to G conversion pads installed inside the igloos and supposedly, he did not know exactly why, he was under the understanding that they were taken out (of the igloos) and then just recently with all this thing about V to G conversion pads, they put them back in (the igloos). I always thought that it was kind of strange that they would have taken them out to begin with. He had no idea who directed the pads to be removed.

b (b)(7)(C) is the (b)(7)(C) basically in charge of the lab, so wherever she said to place them (V to G conversion pads) we have to really do what she says. I asked (b)(7)(C) for clarification on this issue and I believe she put out an e-mail or something. He was not aware of any other directive being put out about the V to G conversion pads placement.

14 (b)(7)(C) (b)(7)(C) and (b)(7)(C) BGCA (b)(7)(C) in recorded testimony obtained by telephone on 6 October 2005 stated:

(b)(7)(D)

15 (b)(7)(C), BGCA (b)(7)(C) in testimony recorded at BGCA on 11 October 2005 stated:

(b)(7)(D)

16 (b)(7)(C), BGCA (b)(7)(C) in testimony recorded at BGCA on 13 October 2005 stated:

a That from approximately 2002 until the time BGCA changed it, the V to G conversion pads were connected only to the heated trace line outside the igloo. He said that his assumption was that the reason why it was moved to the outside was because it was easier to change.

b He believes the decision to move the pads was based on some study and at least some concurrence from CASARM. He believes the change was suggested by (b)(7)(C). He did not know if she made the decision, just that it was done. He stated that normally the monitoring plan or the appropriate SOP would be changed and staffed before any changes would be made.

c He said that he was not familiar with the cited references requiring the placement of the pads at the distal end of the sampling lines. He believes that the documents would have normally been reviewed by (b)(7)(C) at that time. He stated that her supervisor, (b)(7)(C) at that time would have limited knowledge of the cited references.

d That with the V to G conversion pads in place and that historically they have not had VX leakers and most of the sites that had leakers, the leakers occurred years ago, he is not sure that even with the V to G conversion pads, if a low level leak will be detected

twenty feet away. If it is VX and it is leaking out of rocket, he does not believe that they were going to catch it (with the MINICAMS). He thinks the answer is visual inspection. So he is not sure how valuable sampling is short of a major leak.

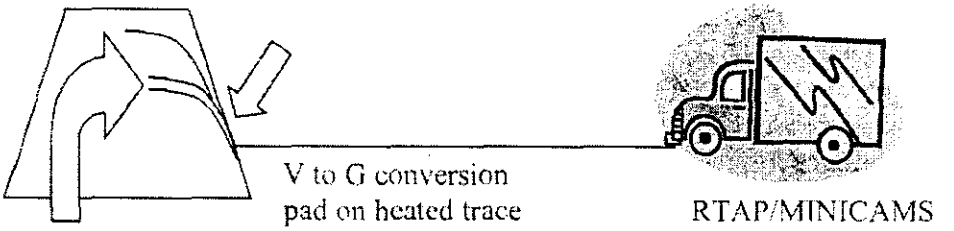
17 (b)(7)(C) BGCA, in testimony recorded on 13 October 2005, stated:

a That the issue with the V to G conversion pads first came to his attention from concerns raised by his RTAP operators who went to a MINICAMs class in Alabama.

b That the CASARM quality assurance plan that stipulates the V to G conversion pads need to be on the distal end of the sampling lines would have gone to the lab (b)(7)(C) or (b)(7)(C) would have been the ones that should have looked at it. He said that he wished he would have seen it. He believed that (b)(7)(C) would have passed this to (b)(7)(C) the level of this plan is too technical for (b)(7)(C) to get into the details. He believes (b)(7)(C) would have given the plan to the lab and asked them to give him an assessment.

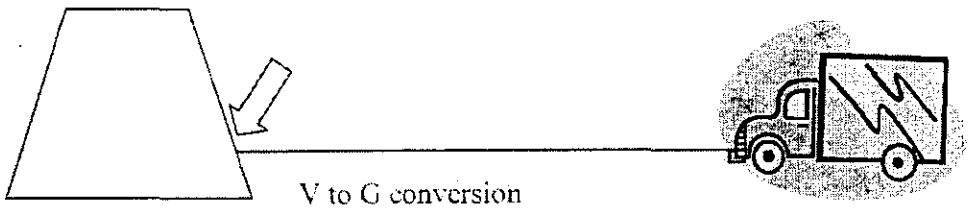
(2) Discussion:

(a) Per the testimony of (b)(7)(C) and the documentary evidence, on or about September 2003, the V to G conversion pads were removed from the distal end of the three sampling lines in each of the BGCA VX igloos. They were removed because the pads were degraded and plugging the flow through the sample lines. The V to G conversion pads located at the end of the heated trace line outside the igloo remained in place (see diagram).



PRIOR TO SEPTEMBER 2003

and POST AUGUST 2005



SEPTEMBER 2003 - AUGUST 2005

(b) The Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance (QA) Plan Revision 3, 1999 did not specify that the V to G conversion pads be placed on the distal end of the sampling lines nor did it specify a change out frequency for the V to G conversion pads. However, as of April 2003, the CASARM QA Plan required the V to G conversion pads to be installed at the distal end of the sampling lines and a semi-annual check of the flow rates through the unheated sample lines within the igloos. These requirements were continued in subsequent revisions to the CASARM QA Plan and included in the June 2004 CMA Monitoring Plan. The CASARM QA Plan, Revision No. 4, March 2003, approved 25 April 2003, states in paragraph 8.1.1.1, page 47: "VX pads shall be placed at the distal end of the sample line." It goes on to state that the site must determine the pad change out frequency based on operational experience. Table 5-1, page 63, of the June 2004 Chemical Materials Agency (CMA) Monitoring Concept Plan also requires that the V to G conversion pads be placed at the distal end of the sample line or probe.

(c) (b)(7)(C) BGCA (b)(7)(C) BGCA (b)(7)(C) and (b)(7)(C) BGCA (b)(7)(C) (b)(7)(C) stated that the required flow rate through the sampling lines within the igloo could not be achieved due to the degradation of the V to G conversion pads. To resolve the problem, the V to G conversion pads were removed. The exact date that the pads were removed cannot be determined, but is believed to be approximately September 2003. Paragraph 6, page 3, of Change No. 3 to Revision 2 of the BGCA Monitoring Plan, dated 4 September 2003, states that Change 3 of Revision 2 ". . .removes filter requirements from sample lines." Testimony from (b)(7)(C) BGCA (b)(7) indicates he believes the change was made in "2002 or 2003." (b)(7)(C) (b)(7)(C) the (b)(7)(C) BGCA (b)(7)(C) stated he believed the MINICAMS sampling configuration with the V to G conversion pads installed only on the distal end of the heated trace line was the configuration in place when he arrived in December 2003.

(d) In her recorded testimony, (b)(7)(C) admitted she was aware of the CASARM requirement for the V to G conversion pads to be installed at the distal end of the unheated sampling lines and that no waiver or exemption to the requirement was requested. She also stated that the sampling configuration with the V to G conversion

pads removed was not tested to determine the impact on the ability of the MINICAMS to detect VX.

(e) (b)(7)(C) was the lead chemist at the time of the removal of the V to G conversion pads from within the igloo and not the lab supervisor. (b)(7)(C) stated the issue was discussed at a staff meeting and she believed she had the concurrence of her supervisor, (b)(7)(C) and that the change to the Monitoring Plan would have been reviewed and approved by the chain of command. However, the approval page with signatures for Change 3 to Revision 2 of the BGCA Monitoring Plan could not be located. In his recalled testimony, (b)(7)(C) denied knowing who made the decision to remove the V to G conversion pads from the inside of the igloos and that he relies on his technical experts to configure the sampling equipment properly. (b)(7)(C), the BGCA (b)(7)(C), and (b)(7)(C), the BGCA (b)(7)(C) stated in their testimony that they were not aware of the required and practiced MINICAMS sampling configuration until the V to G conversion pad placement became an issue in February 2005.

(f) Testimony from those attending the 24 February 2005 meeting indicates that (b)(7)(C) (b)(7)(C) admitted authorizing the removal of the V to G conversion pads from inside the igloos and that she believed she had documents from higher headquarters indicating that this was an acceptable change. (b)(7)(C) however, could not produce any of those documents.

(g) The electronic mail from (b)(7)(C), BGCA (b)(7)(C) (b)(7)(C) dated 25 August 2005 stated the justification for the change was the study conducted by Southern Research Institute (SRI): Southern Research Institute, Analytical Methods Development, Volume 1, Experimental Studies,1985 (pages 179-182) regarding the transfer efficiency of VX vapor through Teflon tubing. BGCA (after-the-fact) justified their actions of removing the VX conversion pad from the unheated sample lines within the igloo because the SRI study showed successful VX vapor transmission through a Teflon sample line with an average transfer efficiency of 84%. There are several issues in using the SRI study as justification for removal of the conversion pads. One issue is the SRI core experiment tested the VX vapor transfer through a six foot Teflon sample line. The sampling lines in the VX igloos range from 40 feet to 100 feet. The second issue is that the VX vapor concentration for the SRI study was unknown to BGCA personnel. Monitoring a high concentration of VX through a sampling line is much easier than monitoring low levels of VX vapor and they can not be compared directly. Several caveats were included in the SRI study: tests were performed with clean, dry, sample gas and clean, dry, Teflon tubing; the efficiency of transport was markedly dependent on the history of the tubing - transfer efficiency through two 12-foot lengths of tubing dropped from greater than 90% to about 70% after the tubing was used to sample 5300 liters of laboratory (not igloo) air; transfer efficiency dropped to 40% when passed through two 12-foot lengths of tubing after they were used to sample 960 liters of air near the exhaust of a diesel engine. There is no evidence that BGCA personnel considered these caveats and implemented the appropriate cautions, warnings, or compensatory

measures in operating procedures. (b)(7)(C) did not mention this SRI study in her testimony and many of those who testified complained that they were never told the justification why the pads were removed from inside the igloos. The last issue for using the SRI study as justification is that the authors of the study recommended against sampling VX vapor solely through Teflon tubing.

(h) The Southern Research Institute (SRI) study on VX transmission provided by (b)(7)(C) as justification for the removal of the V to G conversion pads appears to have been obtained after the V to G conversion pads had been removed; i.e., BGCA sought justification for the removal of the V to G conversion pads only after the removal became an issue. In her testimony, (b)(7)(C) stated higher headquarters had not been consulted prior to the removal of the V to G conversion pads and she seemed to be unaware during this Investigative Inquiry of the SRI study provided by (b)(7)(C) In any case, the SRI study does not justify the removal of the V to G conversion pads as the SRI experimental conditions were not reflective of the BGCA field operating conditions and the SRI bottom line recommendation was not to sample VX through Teflon tubing only.

(i) No documentary or testimonial evidence was offered to suggest that an alternate solution to the flow rate problem (e.g., more frequent change-out of the V to G conversion pads) was considered.

(j) In summary, the documentary and testimonial evidence indicates that because the required flow rate could not be achieved, the V to G conversion pads were removed from the unheated sample lines within the igloos and that this change was implemented without proper staffing, without adequate consideration of the impact on the ability of the MINICAMS to detect VX, and without consideration of alternative solutions to the flow rate problem. Additionally, no effort was made to obtain waivers or exemptions from the standards.

(3) Conclusion: The allegation that (b)(7)(C) a Blue Grass Chemical Activity (BGCA) (b)(7)(C) improperly ordered the removal of the Miniature Continuous Air Monitoring System (MINICAMS) V to G conversion pads from the distal ends of the unheated sampling lines in violation of the Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance Plan, Revision 4, and Revision 5, dated March 2003, and approved 25 April 2003, and dated November 2004, and approved December 2005, respectively, and the U.S. Army Chemical Materials Agency Programmatic Monitoring Concept Plan, June 2004 **IS SUBSTANTIATED.**

e. Allegation 2: That (b)(7)(C), the (b)(7)(C) improperly allowed the removal of the MINICAMS V to G conversion pads from the distal ends of the unheated sampling lines in violation of the Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance Plan, Revision 4 and Revision 5, dated March 2003, and approved 25 April 2003, and dated November 2004,

and approved December 2005, respectively, and the U.S. Army Chemical Materials Agency Programmatic Monitoring Concept Plan, June 2004.

(1) Evidence:

(a) Standards:

1 Paragraph 8.1.1.1, page 47, of The Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance (QA) Plan for Chemical Agent Monitoring, Revision 4, dated March 2003, and approved 25 April 2003, stated that "VX pads shall be placed at the distal end of the sample line." Paragraph 12.3.1, pages 70-71, of the CASARM QA Plan, states "The organization shall maintain records which demonstrates that flow rates are determined as follows: . . At the end of the unheated sample lines inside storage structures semi-annually, not to exceed eight months."

2 Paragraph 8.1.1.1, page 42, of the CASARM QA Plan for Chemical Agent Monitoring, Revision 5, dated November 2004, and approved December 2004, states that "VX pads shall be placed at the distal end of the sample line."

3 Table 5-1 with footnote e, page 63, of the Chemical Materials Agency Monitoring Concept Plan, dated June 2004, requires the V to G conversion pads (AgF Pads) be placed at the distal end where distal end is defined as "the point at which the sample enters the sample line or sample probe."

(b) Documentary Evidence:

1 Change 3 to Revision 2 of the Blue Grass Chemical Activity Monitoring Plan, dated 4 September 2003, removed the requirement for installing V to G conversion pads at the distal end of the VX sampling lines within the igloo. The Monitoring Plan approval page with signatures indicating review and approval of the change by the chain of command could not be located during this Investigative Inquiry.

2 Position Description # AU168393 for the Chemical Operations Manager, GS-0301-12, classified date of 5 February 2000, requires incumbent in the position to "insure all aspects of operations comply with governing regulations . . . develop and review standing operating procedures for inspection, monitoring, storage, and movement of chemical munitions and hazardous waste, . . . disseminate new or revised directives, instructions and informational material in the interpretation and application of such material . . . make periodic exclusion area visits to determine the adequacy and effectiveness of monitoring and storage functions to insure compliance with established procedures, regulatory requirements, and safety practices."

(c) Testimonial Evidence:

1 (b)(7)(C), BGCA (b)(7)(C) in testimony recorded at BGCA on 11 October 2005 and 13 October 2005 stated:

(b)(7)(D)

2 (b)(7)(C) BGCA (b)(7)(C), in testimony recorded at BGCA on 13 October 2005 stated:

(b)(7)(D)

(b)(7)(D)

3 (b)(7)(C) BGCA (b)(7)(C) in testimony recorded at BGCA on 13 October 2005 stated:

a That he believes that the decision to move the pads was based on some study and at least some concurrence from CASARM. He believes it was suggested by (b)(7)(C) (b)(7)(C) He did not know if she made the decision, just that it was done.

b That he was not familiar with the cited references in the allegations. He believes the document would have normally been reviewed by (b)(7)(C) at that time. He stated that her supervisor, (b)(7)(C) at that time would have limited knowledge of the cited references.

4 (b)(7)(C) BGCA, in testimony recorded at BGCA on 13 October 2005, (b)(7)(D)

(b)(7)(D)

(2) Discussion:

Although (b)(7)(C) did not adequately perform his supervisory duties in accordance with the position description, there is no documented evidence that he approved the removal of the V to G conversion pads from the distal end of the sampling lines within the VX igloos. Testimony from (b)(7)(C) and (b)(7)(C) (b)(7)(C) indicate the expectation was that interpretation of the CASARM and CMA agent monitoring requirements and the determination of the placement of the V to G conversion pads would have been delegated to the technical experts in the laboratory. Additionally, no signatures are present on the review and approval page of Change 3 to Revision 2 of the Blue Grass Chemical Activity Monitoring Plan, dated 4 September 2003 which removed the requirement for installing V to G conversion pads at the distal end of the VX sampling lines within the VX igloos. (b)(7)(C) asserts she

had the concurrence of (b)(7)(C) for the change, but no documentation of his concurrence or the concurrence of CMA or CASARM could be produced. (b)(7)(C) asserts he does not know who made the decision to remove the V to G conversion pads.

(3) Conclusion: The allegation that (b)(7)(C) the Director for Chemical Operations, did improperly allow the removal of the MINICAMS V to G conversion pads from the distal ends of the unheated sampling lines in violation of the Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance Plan, Revision 4 and Revision 5, dated March 2003, and approved 25 April 2003, and dated November 2004, and approved December 2005, respectively, and the U.S. Army Chemical Materials Agency Programmatic Monitoring Concept Plan, June 2004 **IS NOT SUBSTANTIATED.**

f. Issue 1: (b)(7)(C) the (b)(7)(C) was concerned that the miniature chemical agent monitoring system (MINICAMS) sampling configuration at BGCA for VX was incorrect.

(1) Evidence:

(a) Standards:

1 Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance (QA) Plan for Chemical Agent Air Monitoring, Revision 3, 1999, did not contain instructions regarding the placement of the V to G conversion pads.

2 The O.I. Analytical Operation Manual for the Field MINICAMS, October 2000, does not contain instructions related to the use and location of V to G conversion pads.

3 Paragraph 8.1.1.1, page 47, of The Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance (QA) Plan for Chemical Agent Monitoring, Revision 4, dated March 2003, and approved 25 April 2003, stated that "VX pads shall be placed at the distal end of the sample line."

4 Paragraph 8.1.1.1, page 42, of the CASARM QA Plan for Chemical Agent Monitoring, Revision 5, dated November 2004, and approved December 2004, states that "VX pads shall be placed at the distal end of the sample line."

5 Table 5-1 with footnote "e", page 63, of the Chemical Materials Agency Programmatic Monitoring Concept Plan, dated June 2004, requires the V to G conversion pads (AgF Pads) be placed at the distal end where distal end is defined as the "point at which the sample enters the sample line or sample probe."

(b) Documentary Evidence:

1 Revision 1 to the Blue Grass Chemical Activity Monitoring Plan, dated 25 March 1997 added MINICAMS to the list of air monitoring equipment used and changed the requirement to change out the V to G conversion pads from "as entered" to once a quarter for each VX structure.

2 Change 3 to Revision 2 of the Blue Grass Chemical Activity Monitoring Plan, dated 4 September 2003, removed the requirement for installing V to G conversion pads at the distal end of the VX sampling lines within the igloo.

3 In an electronic mail dated 25 August 2005, subject: VX Transmission, (b)(7)(C) (b)(7)(C) Blue Grass Chemical Activity, stated the attachment to the electronic mail: Southern Research Institute (SRI), Analytical Methods Development, Volume 1, Experimental Studies, 1985, pages 179-182, was the rationale the BGCA lab used to relocate the V to G conversion pads and that the gist of the attached was that VX vapor will be transmitted and detected through tubing without V to G conversion pads.

4 Southern Research Institute, Analytical Methods Development, Volume 1, Experimental Studies, 1985, pages 179-182, documented the average transfer efficiency of VX through 6-feet of Teflon tubing as 86%. The study was conducted with the Depot Area Air Monitoring System (DAAMS) air monitoring system. The study also included the following caveats: tests were performed with clean, dry sample gas and clean dry Teflon tubing; transfer of VX vapor through Teflon tubing was markedly dependent upon the history of the tubing; transfer efficiency through two 12-foot lengths of tubing fell to 70% from greater than 90% after tubing was used to sample 5300 liters of laboratory air with 30 liters of generator effluent and to 40% when used to sample 960 liters of air near the exhaust of a diesel engine. Study recommended against sampling VX vapor solely through Teflon tubing.

5 In an electronic mail from (b)(7)(C) to (b)(7)(C) dated 23 February 2005, subject: VX Sampling, (b)(7)(C) refers to the SRI study and writes: " . . .On pages 180-182, they document attempts to sample VX vapor through 6" of Teflon tubing. They ended up recommending that VX vapor should not be sampled through Teflon tubing. . .". (b)(7)(C) also writes in the electronic mail, referring to CMS Products: "Mainly though, the teaching that VX will not transport through Teflon tubing without first being converted to the G analog is based on our experience. . . As I told the students, if this works, it goes against our experience."

6 Precision and Accuracy (P & A) Studies and MINICAMS Calibration Records sampled from 1998 - 2005 inclusive indicate that the MINICAM instruments were being challenged and calibrated properly for the sampling configurations in use.

(2) Discussion:

(a) On or about September 2003, the V to G conversion pads were removed from the distal end of the three sampling lines in each of the BGCA VX igloos. They were removed because the pads were degraded and plugging the flow through the sample lines. The V to G conversion pads located at the end of the heated transfer line outside the igloo remained in place.

(b) The electronic mail from (b)(7)(C) BGCA (b)(7)(C) (b)(7)(C) dated 25 August 2005 stated the justification for the change is the study conducted by Southern Research Institute (SRI): Southern Research Institute, Analytical Methods Development, Volume 1, Experimental Studies,1985 (pages 179-182) regarding the transfer of VX vapor through Teflon tubing. BGCA personnel justified their actions of removing the VX conversion pad because the SRI study showed successful VX vapor transmission through a Teflon sample line with an average transfer efficiency of 84%. There are several issues in using the SRI study as justification for removal of the conversion pads. One issue is the SRI core experiment tested the VX vapor transfer through a six foot Teflon sample line. The sampling lines in the VX igloos range from 40 feet to 100 feet. The second issue is that the VX vapor concentration for the SRI study was unknown to BGCA personnel. Monitoring a high concentration of VX through a sampling line is much easier than monitoring low levels of VX vapor and they can not be compared directly. Several caveats were included in the SRI study: tests were performed with clean, dry, sample gas and clean, dry, Teflon tubing; the efficiency of transport was markedly dependent on the history of the tubing - transfer efficiency through two 12-foot lengths of tubing dropped from greater than 90% to about 70% after the tubing was used to sample 5300 liters of laboratory (not igloo) air; transfer efficiency dropped to 40% when passed through two 12-foot lengths of tubing after they were used to sample 960 liters of air near the exhaust of a diesel engine. There is no evidence that BGCA personnel considered these caveats and implemented the appropriate cautions, warnings, or compensatory measures in operating procedures. The last issue for using the SRI study as justification is that the authors of the study recommended against sampling VX vapor solely through Teflon tubing.

(c) The Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance (QA) Plan Revision 3, 1999 did not specify that the V to G conversion pads be placed on the distal end of the sampling lines nor did it specify a change out frequency for the V to G conversion pads. However, the CASARM QA Plan, Revision No. 4, March 2003, approved 25 April 2003, states in paragraph 8.1.1.1, page 47: "VX pads shall be placed at the distal end of the sample line." It goes on to state that the site must determine the pad change out frequency based on operational experience.

(d) Table 5-1, page 63, of the June 2004 Chemical Materials Agency (CMA) Programmatic Monitoring Concept Plan also requires that the V to G conversion pads be placed at the distal end of the sample line or probe.

(e) As discussed in Allegation 1, the decision to remove the V to G conversion pads from the distal end of the sampling lines was made without proper staffing and review, or adequate consideration of the impact on the capability of the MINICAMS to detect VX. The SRI study was not adequate justification for the change and appears to have been obtained by BGCA long after the decision to remove the V to G conversion pads within the igloos had been made and the change implemented. The (b)(7)(C) who made the decision to remove the V to G conversion pads was not in a supervisory position. The (b)(7)(C) who was in charge of laboratory and agent monitoring operations failed to adequately discharge his supervisory duties and apparently was so disengaged from the day-to-day laboratory and VX monitoring operations that he did not know the V to G conversion pads had been removed and therefore the proper risk assessment and review of the monitoring change was not accomplished. The extent of the degradation in the capability of the MINICAMS to detect VX during the timeframe when the V to G conversion pads had been removed from the distal end of the sampling lines is unknown. The experiments in the available analytical studies were not designed to duplicate monitoring of VX munitions in a field environment. The SRI study indicated significant decreases in VX transfer efficiency for 12-foot sampling lines and the sampling lines used to monitor the BGCA VX igloos are 40 to 100 feet long. The transport efficiency of VX vapor through long sampling lines is very poor. For this reason a VX conversion pad is used to convert VX to a different compound (G-analog) that has a much better transport efficiency. VX is not expected to be measured at the Short Term Exposure Limit or Worker Population Level at the end of 40 - 100 foot sampling lines that are not equipped with a V to G conversion pad located at the distal end of the line. It is unlikely that the MINICAMS would have been effective in detecting anything but gross levels of VX leakage while the V to G conversion pads were not installed at the distal end of the sampling point.

(f) Guidance regarding the placement of the V to G conversion pads within the igloos was first issued in the March 2003 revision of the CASARM QA Plan, which was approved in April 2003. On or about September 2003, when the V to G conversion pads were removed from inside the igloos, BGCA was in violation of the requirements in the 2003 CASARM QA Plan and beginning in June 2004, was also in violation of the CMA Monitoring Concept Plan.

(g) The evidence shows that correct procedures were used to challenge and calibrate the MINICAMS equipment based on the sampling configuration in use. But, because the sample was not properly collected through the sampling lines to the heated trace line, an accurate measurement of any VX agent vapor release would not have been possible during the period when the V to G conversion pads were not located at the distal end of the VX igloo sampling lines.

(h) Beginning in July 2005, V to G conversion pads were again installed at the ends of the igloo sampling lines. In accordance with Table 5-1 of the Blue Grass Chemical Activity Site-Specific Monitoring Plan (March 2005), a study was conducted from 04 May 2005 until 15 June 2005 to determine the expected useful life time for the pads. An

additional study was started on 14 Sep 2005 and will continue for the next 12 months. As the sample lines fail the transmission efficiency criteria of 75% recovery, the V to G conversion pads will be replaced. This data will provide a performance baseline to be used as a reference for V to G conversion pad change out frequency.

(3) Conclusion: The concern that the miniature chemical agent monitoring system (MINICAMS) sampling configuration at BGCA for VX was incorrect **IS FOUNDED** for the period September 2003 through August 2005.

g. Issue 2: (b)(7)(C) is concerned that the V to G conversion pads have not been changed out as required, resulting in erroneous readings when monitoring VX.

(1) Evidence:

(a) Standards:

1 The Field MINICAMS Maintenance Workbook, CMS Field Products, October 2004 does not specify a change-out frequency for the V to G conversion pads.

2 The Operation Manual for the Field MINICAMS, O.I. Analytical, CMS Field Products, October 2000, does not specify a change out frequency for the V to G conversion pads.

3 The CASARM QAP, Revision 3, 1999 does not reference the use of V to G conversion pads on the distal end of sampling lines nor does it specify a change out frequency.

4 Paragraph 12.2.4, page 70, of the CASARM QAP, Revision 4, dated March 2003 and approved 25 April 2003, requires conversion pads for Time-Weighted-Average (TWA) level methods be replaced as operational experience dictates at each Type 1 monitoring stations during VX operations.

(b) Documentary Evidence:

1 Blue Grass Chemical Activity Standing Operating Procedure (SOP) BT-0000-W-604, Air Monitoring Procedures, Revision No. 3, 15 May 2002, requires, in Operation No. 11, Step 1, Daily Preventive Maintenance, that the V to G conversion pad installed at the distal end of the heated trace line be removed immediately after doing VX monitoring.

2 Blue Grass Chemical Activity SOP BT-0000-W-604, Air Monitoring Procedures, Revision No. 4, 26 June 2003, requires in Operation No. 11, Step 1, Daily Preventive Maintenance, that the V to G conversion pad installed at the distal end of the heated trace line be removed immediately after doing VX monitoring.

3 Blue Grass Chemical Activity SOP BT-0000-W-604, Air Monitoring Procedures, Revision No. 4, Change No. 2, 18 April 2005, requires in Operation No. 5, Step 1, Daily Preventive Maintenance, that the V to G conversion pad installed at the distal end of the heated trace line be removed immediately after doing VX monitoring.

4 The BGCA Type I Monitor Log Sheets for VX igloos from September 2004 through September 2005 were reviewed in their entirety as well as a random sample from calendar years 2000 - 2005. The documents indicate that MINICAM quality check challenges for VX either were successful or corrective action, including, in several cases, replacement of the V to G conversion pads was accomplished. The Log Sheets also were annotated that the V to G conversion pad at the end of the heated trace line was removed and disposed of when used per local procedures.

(c) Testimonial Evidence: None

(d) Other Evidence:

1 During the period 4 - 6 October 2005 (b)(7)(C) and (b)(7)(C) (b)(7)(C) subject matter experts, and Temporary Assistant IGs observed VX agent monitoring operations and met with (b)(7)(C) BGCA (b)(7)(C) (b)(7)(C) and (b)(7)(C) BGCA (b)(7)(C) (b)(7)(C) to discuss monitoring operations, monitoring data, and historical and current use of V to G conversion pads.

2 The description of the V to G conversion pad degradation encountered at the distal end of the sampling lines within the VX igloos in September 2003 matched the pattern of degradation Dr. Brimhall and Mr. Ercanbrack have seen on pads that are exposed to too much moisture during use.

(2) Discussion:

(a) Four distinct time frames and two distinct V to G conversion pad locations need to be considered when evaluating whether the pads were changed out appropriately. Prior to September 2003, and after August 2005, the V to G conversion pads were located at the distal end of the sampling lines within all the VX igloos and at the end of the heated trace line outside the igloo. Between September 2003 and July 2005, the V to G conversion pads were located only at the end of the heated trace line outside the igloo. Beginning in July 2005, BGCA began to re-install the V to G conversion pads within the VX igloos and completed the project by 31 August 2005.

(b) The MINICAMS were incorporated into BGCA agent monitoring operations in 1997. Local plans and procedures in place prior to September 2003 required the V to G conversion pads within the VX igloos to be replaced either when the VX igloo was entered and/or during the quarterly storage monitoring inspections. The V to G conversion pads at the end of the heated trace lines were required to be installed prior to

the start of VX headwall monitoring and removed and disposed of after completion of daily VX operations.

(c) (b)(7)(C) and (b)(7)(C) conclude that the fact that the V to G conversion pads at the distal end of the sampling lines within the VX igloos were plugging is evidence that they were not being replaced on an appropriate schedule.

(d) Beginning in July 2005, V to G conversion pads were again installed at the ends of sampling lines within the VX igloos. In accordance with Table 5-1 of the Blue Grass Chemical Activity Site-Specific Monitoring Plan (March 2005), a study was conducted from 04 May 2005 until 15 June 2005 to determine the expected useful life time for the pads. An additional study was started on 14 Sep 2005 and will continue for the next 12 months. As the sample lines fail the transmission efficiency criteria of 75% recovery, the V to G conversion pads will be replaced. This data will provide a performance baseline to be used as a reference for V to G conversion pad change out frequency. Initial results indicate the V to G conversion pads should be changed out at least every six weeks. The BGCA Commander has determined that the change out frequency will be every four weeks for the V to G conversion pads within the igloos.

(e) Summary: The BGCA Type I Monitor Log Sheets and discussions with the MINICAMS operators indicate that the V to G conversion pads located at the ends of the heated trace line outside the igloo were being removed at the conclusion of VX operations and replaced prior to the next monitoring cycle as required by BGCA SOPs. The V to G conversion pads at the distal end of the sampling lines within the igloo prior to September 2003 were likely not being replaced on an appropriate schedule since they were plugging up. However, there is no evidence that VX monitoring operations continued with plugged V to G conversion pads when the appropriate air flow rate could not be achieved. From September 2003 to July 2005, the V to G conversion pads were not installed within the VX igloos.

(3) Conclusion: (b)(7)(C) concern that the V to G conversion pads have not been changed out as required, resulting in erroneous readings when monitoring VX is **UNFOUNDED.**

h. Issue 3: (b)(7)(C) complains that maintenance of air monitoring equipment used at BGCA was deficient and requests a review of maintenance procedures.

(1) Evidence:

(a) Standards:

1 Operation Manual for the Field MINICAMS, O.I. Analytical, CMS Field Products, October 2000 provides basic information for the trained MINICAMS operator about diagnosing and resolving basic operating problems.

2 Field MINICAMS Maintenance Workbook, CMS Field Products, October 2004 provides the detailed troubleshooting and periodic maintenance procedures for the MINICAMS that is performed above the operator level.

(b) Documentary Evidence:

1 DA Form 2404, Equipment Inspection and Maintenance Worksheets from January 2003 through September 2005 were reviewed and show that MINICAMS instrument failures are addressed on a timely basis and that MINICAMS failures are typical for this type of electronic equipment used in a field operating environment.

2 MINICAMS Repair and Preventive Maintenance Forms (no form number) are used to record the semiannual maintenance conducted on each MINICAMS. The maintenance checkpoints on this form are comprehensive. Review of the MINICAMS Repair and Maintenance Forms from January 2003 through September 2005 document that semi-annual maintenance actions have been conducted routinely and on schedule.

3 The BGCA Type I Monitor Log Sheets for VX igloos from September 2004 through September 2005 were reviewed in their entirety as well as a random sample from calendar years 2000 - 2005. The Log Sheets indicate that the MINICAMS were challenged appropriately prior to operations and corrective action taken when problems were encountered.

(c) Testimonial Evidence:

1 (b)(7)(C) a BGCA (b)(7)(C) stated in testimony recorded on 12 October 2005 that (b)(7)(D) (b)(7)(D)

2 (b)(7)(C) a BGCA (b)(7)(C) and (b)(7)(C) (b)(7)(C) stated in testimony recorded on 13 October 2005 that no one has forced him to use equipment that was not working properly.

(d) Other Evidence:

The MINICAMS maintenance shop at Building 4 was surveyed on 5 October 2005 by (b)(7)(C) and (b)(7)(C) subject matter experts and Temporary Assistant Inspectors General. The repair shop had excellent resources, a good stock of replacement parts, and two Continuous Monitoring System (CMS) trained repair technicians.

(2) Discussion: Review of maintenance records indicate that MINICAMS maintenance is conducted routinely and on schedule by appropriately trained technicians. Records also indicate that instrument failures are typical for this type of electronic

equipment and are addressed on a timely basis. Interviews with BGCA personnel did not uncover any claims that unserviceable MINICAMS were used to monitor VX igloos. The monitoring log sheets also fail to substantiate any instances of unserviceable MINICAMS being used during VX operations.

(3) Conclusion: (b)(7)(C) concern that maintenance of air monitoring equipment used at BGCA was deficient is **UNFOUNDED.**

i. Issue 4: (b)(7)(C) is concerned that workers' lives and health may have been jeopardized due to faulty air monitoring of VX igloos.

(1) Evidence:

(a) Standards:

1 AR 385-61, The Army Chemical Agent Safety Program, 12 October 2001, introduced the concept of airborne exposure limits (AELs). For VX, the Immediate Dangerous to Life and Health (IDLH) limit was set at 0.02 mg/ m^3 (Table 2-2, page 11), the eight-hour time weighted average (TWA) limit was set at 0.00001 mg/m^3 for unmasked agent workers in any work shift (Table 2-3, page 11); and the no effects concentration was stated to be 0.000003 mg/m^3 (Table 2-4, page 11).

2 The Implementation Guidance Policy for Revised Airborne Exposure Limits for GB, GA, GD, GF, VX, H, HD, and HT, 18 June 2004, revised the chemical agent AELs, monitoring requirements, and medical evaluation criteria. For VX, the implementation deadline for this standard was 1 January 2005. Per Table 1, page 3, of The Implementation Guidance, revised AELs were established at: for the unprotected workers, the Worker Population Limit, eight hour TWA limit for VX is 0.000001 mg/m^3, the 15 minute Short Term Exposure Limit (STEL) for VX is 0.00001 mg/m^3 with only one exposure per day at the STEL allowed, and the IDLH is 0.003 mg/m^3. For VX, these levels are significantly lower than those that were specified in AR 385-61. However, concurrently with the implementation of this standard at BGCA, the Commander directed that the minimum level of personnel protective equipment for entry into agent igloos would require that the M40A1 mask be worn. Per paragraph 8, page 6, of the Implementation Guidance, the M40 series chemical biological agent protective mask has an assigned protective factor (APF) of 50; i.e., the M40A1 mask provides protection up to 50 times the WPL (8 hours maximum) and STEL limits (15 minutes maximum). Self-contained breathing apparatus and not the M40A1 would be worn in IDLH environments.

3 DA Pamphlet 385-61, Toxic Chemical Agent Standards, 27 March 2002, defined a (nerve agent) exposed worker as an individual who exhibits clinical signs or symptoms of nerve agent intoxication or who has cholinesterase depression consistent with nerve-agent effect. A potentially exposed worker was defined as an individual who works in an agent operating area where levels of nerve agent exceed the protective capability of the personnel protective equipment (PPE) or where levels of nerve agent are detectable and

there is a breech in PPE or engineering controls (Glossary, page 73). These definitions were superseded by the 10 June 2003 Interim Guidance on Nerve Agent Decontamination in the Industrial Setting.

4 Paragraph 2-8, pages 6 and 7, of the 10 June 2003 Interim Guidance on Nerve Agent Decontamination and Medical Services in the Industrial Setting defined an exposed worker as any individual (with a nerve agent exposure potential) who exhibits clinical signs or symptoms of nerve agent intoxication. Additionally, a worker is presumed to have been exposed to nerve agents (even if asymptomatic) if he or she has an acute depression in acetyl cholinesterase (AChE) of 10% or greater from baseline following work activities in a nerve agent operating area and has had no immediate history of contact with other cholinesterase-inhibiting substances and has had no corresponding reduction in red cell mass or has phosphoric acid metabolites specific for nerve agents in urine assays as described in Technical Bulletin, Medical (TB MED) 296. A potentially exposed worker was defined as an individual who works in a nerve-agent operating area where levels of nerve agent exceed the protective capability of the PPE and are detectable at or above the applicable AEL and there is a breach in the PPE or a failure in engineering controls. These definitions were in effect until 10 June 2004 when they were superseded by the agent exposure definitions included in the Appendix A attachment to the 18 June 2004 Implementation Guidance Policy for New Airborne Exposure Limits for GB, GA, GD, GF, VX, H, HD, and HT.

5 Appendix A, paragraph 5-1, of the Interim Guidance on Occupational Health Practices for the Evaluation and Control of Occupational Exposures to Nerve Agents GA, GB, GD, GF, and VX, 8 June 2004, defines an exposed worker as an individual (with a nerve agent exposure potential) who exhibits clinical signs or symptoms of nerve agent intoxication. In addition, a worker is presumed to have been exposed to nerve agents (even if asymptomatic) if he or she has a confirmed acute depression in Red Blood Count - Cholinesterase (RBC-ChE) activity (greater than 10%) from baseline following presence in a nerve agent chemical limited area and has had no immediate history of contact with other cholinesterase-inhibiting substances, such as carbamates or organophosphate pesticides and has nerve agent urinary metabolites, as identified by the U.S. Army Medical Research Institute of Chemical Defense (USAMRICD) on GC/MS analysis (see TB MED 296), or other validated nerve agent-specific biomarkers. A potentially exposed worker is defined as an individual (with a nerve agent exposure potential) who is present within a chemical limited area or exclusion area where levels of nerve agent exceed the respiratory or dermal protective capability of intact PPE or where levels of nerve agent are detectable at the established dermal threshold concentrations for specific nerve agents and there is a breach in PPE or the levels of nerve agent exceed the STEL and there is a failure in engineering controls involving unprotected personnel.

6 Paragraph 4-7, page 5, of DA Pamphlet 40-8, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX, 4 December 1990, required the examining official of an exposed or potentially exposed individual to provide the appropriate medical examinations. RBC-ChE

monitoring, and emergency treatment, to document the occupational health records with an opinion of the exposure effect, and to record any atmospheric monitoring measurements in the occupational health records.

7 Paragraph 2-7c, page 7, of the 10 June 2003 Interim Guidance on Nerve Agent Decontamination and Medical Services in the Industrial Setting, required the Competent Medical Authority treating an individual who has been accidentally exposed or potentially exposed to also obtain information concerning the circumstances of the exposure or potential exposure in addition those actions specified in DA Pamphlet 40-8.

8 Paragraph 2-7, page 10, of Appendix A, of the Interim Guidance on Occupational Health Practices for the Evaluation and Control of Occupational Exposures to Nerve Agents GA, GB, GD, GF, and VX, 8 June 2004, superseded the nerve agent medical evaluation criteria of paragraph 4-7 of DA Pamphlet 40-8 and paragraph 2-7c of the 10 June 2003 Interim Guidance. The 8 June 2004 Guidance requires, for exposed or potentially exposed nerve agent exposure, that the Competent Medical Authority obtain information concerning the circumstances of the exposure or potential exposure and provide the appropriate medical examinations (for example, RBC-ChE monitoring) and emergency treatment if warranted, document in the medical record the circumstances of the exposure or potential exposure, the results of the examination, and an opinion as to whether a nerve agent exposure has occurred, and record any air-monitoring measurements in the medical record.

9 Blue Grass Army Depot Occupational Health Clinic Standing Operating Procedure for Medical Surveillance and Treatment for Nerve Agent Exposure or Potential Exposure, MCXM-PM-M, 20 January 2005, incorporated the nerve agent medical evaluation criteria of Appendix A of the 8 June 2004 Interim Guidance.

(b) Documentary Evidence:

1 In a memorandum dated 10 June 2003, subject: Interim Guidance on Nerve and Mustard Agent Decontamination and Medical Services in Industrial Activities, the Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health) Office of the Assistant Secretary of the Army (Installations and Environment) directed the immediate implementation of the Interim Guidance on Nerve Agent Decontamination and Medical Services in the Industrial Setting with full compliance to be achieved by 1 October 2003.

2 In a memorandum dated 18 June 2004, subject: Implementation Guidance Policy for New Airborne Exposure Limits for GB, GA, GD, GF, VX, H, HD, and HT, the Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health) Office of the Assistant Secretary of the Army (Installations and Environment) directed the implementation of the revised AEL criteria and 8 June 2004 Interim Guidance for Occupational Health Practices for nerve agents by 1 January 2005.

3 In a memorandum dated 3 January 2005, subject: BGCA Policy Letter, Interim Masking Policy for Airborne Exposure Limit Compliance, the Commander, Blue Grass Chemical Activity, directed that the M40 series chemical biological agent protective mask be worn during GB and VX operations.

4 Change 3 to Revision 2 of the Blue Grass Chemical Activity Monitoring Plan, 4 September 2003, removed the requirement for V to G conversion pads on the distal end of the sample lines within the VX igloos.

5 The BGCA Chemical Duty Position Rosters (April - September 2005) contained names and positions of personnel in the Chemical Personnel Reliability Program who have access to chemical agent exclusion areas (e.g., igloos) under the two-person rule and have the risk of potential exposure to VX.

6 The Chemical Limited Area access roster (undated) contained names of personnel who had access, either escorted or unescorted, who had access to areas around chemical exclusion areas and have some risk of potential exposure to VX.

7 BGCA Type I Monitor Log Sheets and Entry Logs - VX igloos (7 September 2004 - 28 September 2005) contained the names of all personnel who entered the VX igloos and the name of the RTAP/MINICAMS operator who was in the area before and during VX operations.

8 BGCA Medical Surveillance Matrix, Revision 1, 6 December 2004, contained the names of personnel who were in a medical surveillance program and who had some risk of potential exposure to chemical agent.

9 Electronic mail correspondence from (b)(7)(C) to (b)(7)(C) dated 4 October 2005, 11:05 a.m., subject: CHEs for CAT II contained the names of medical surveillance Category II individuals who had been in the Chemical Limited Area and who needed RBC-ChE baselines or updates. A (b)(7)(C) was included on the list of personnel requiring a baseline RBC-ChE.

10 Igloo entry logs and BGCA Type I Monitor Log Sheets - random sample (July 2001 - September 2005 inclusive) contained the names of individuals who had entered agent igloos or who were in the vicinity when agent operations were on-going.

11 Emergency Operations Center Daily Journal - VX igloos (18 December 2000 - 7 October 2005) documented four unconfirmed MINICAMS detections of VX: An unconfirmed reading of 0.29 Time Weighted Average (TWA) (0.0000029 mg/m^3) at igloo F407 on 8 January 2002; an unconfirmed MINICAMS reading of 0.30 TWA (0.0000030 mg/m^3) at igloo F104 on 14 March 2002; an unconfirmed MINICAMS reading of 0.27 TWA (0.0000027 mg/m^3) at igloo F207 on 30 September 2002; and an unconfirmed MINICAMS reading of 0.29 TWA (0.0000029 mg/m^3) at igloo F102 on 30 September 2002.

12 Eighty-six Standard Form 512's, Clinical Records - Plotting Charts reviewed documented three instances of AChE depression of less than 10%. Three SF 512's dated 11 May 2000 indicated an AChE depression of less than 10% with annotations "rule out exposure": (b)(7)(C) and (b)(7)(C)

13 Personnel Monitoring Records dated 9 May 2000 and 10 May 2000 document entry into GB igloos by (b)(7)(C) and (b)(7)(C)

14 Of thirty SF 600's Occupational Health Medical Records reviewed, there were four cases in which the medical records indicated the health clinic staff suspected nerve agent exposure: three dated 11 May 2000 as noted in the above paragraph and one dated 7 September 2005 for (b)(7)(C), a (b)(7)(C) (b)(7)(C) (b)(7)(C) had not had a RBC-ChE baseline; therefore, no SF 512 had been generated for him as of the start of this Investigative Inquiry, 3 October 2005.

15 The SF 600 for (b)(7)(C), dated 7 September 2005, includes the following note signed by (b)(7)(C) "Had VX exposed to VX yesterday."

16 MINICAMS operator certification records indicated that (b)(7)(C) (b) is certified for GB MINICAMS operations, but not yet certified for VX MINICAMS operations.

17 The BGCA Type I Monitor Log Sheets for 2- 6 September 2005 document (b)(7)(C) (b)(7)(C) performing VX line/MINICAMS challenge work at Building 1661 on 6 September 2005.

18 The Personnel Monitoring, Heat Stress, and Igloo Check Sheet Records for August 2005 and September 2005 do not document any agent igloo entries by (b)(7)(C) (b)(7)(C)

19 U.S. Army Chemical Materials Agency (CMA) Presentations - Leak Occurrences in the U.S. Chemical Weapons Stockpile, Blue Grass Chemical Activity 1 January 1973 - 31 July 2005; Anniston Chemical Activity, Pine Bluff Chemical Activity, and Umatilla Chemical Depot, 1 January 1973 - 31 December 2004 and CMA VX Rocket Leaks database document a historically low rate of leakers in the VX stockpile of 115mm VX rockets, 155mm VX projectiles, and 115mm VX rocket warheads.

20 BGCA Type I Monitor Log Sheets for September 2004 and September 2005 record no detect readings for VX agent.

(c) Testimonial Evidence:

1 In an unrecorded, but signed statement made to (b)(7)(C) Assistant Inspector General and (b)(7)(C) Temporary Assistant Inspector General, on 5 October 2005, at the Blue Grass Chemical Activity, (b)(7)(C) (b)(7)(C) Blue Grass Chemical Activity, (b)(7)(C) related the following:

a On 6 September 2005, (b)(7)(C) had been working in and around Real Time Monitoring Platforms (RTAPs) and Miniature Continuous Air Monitoring System (MINICAMS) where chemical agent VX in dilute form was present.

b On the evening of 6 September 2005, (b)(7)(C) had started to feel ill with unusual sensitivity and sensations in his left arm and extreme fatigue.

c On 7 September 2005, (b)(7)(C) had participated in a training exercise and was still feeling ill at the conclusion of the exercise. At the request of his supervisor, (b)(7)(C) (b)(7)(C) he reported to the Occupational Health Clinic, BGAD.

d On 7 September 2005, after explaining his symptoms to (b)(7)(C) stated (b)(7)(C) asked him if he felt he had been exposed to any agent. (b)(7)(C) stated he interpreted "exposed" to mean "worked around agent" and answered that the last agent he had been exposed to was VX.

e (b)(7)(C) stated the clinic "sent me on my way" and indicated that there had been no further evaluation for VX exposure when asked by (b)(7)(C) what the clinic did for him.

f (b)(7)(C) also stated that he did not feel that he had been exposed to VX if "exposure" meant skin contact or inhaling VX and that no VX vials had been broken when he was working with the MINICAMS on 6 September 2005.

2 (b)(7)(C) Blue Grass Army Depot (BGAD), in testimony recorded on 12 October 2005, stated:

a (b)(7)(C) reported to the clinic on 7 September 2005 complaining of a tingling sensation in one arm, his left arm, I think. I examined him and I did not really find anything.

b (b)(7)(C) mentioned that he thought he had been exposed (to VX) and again there were no signs of any kind of changes you would expect to find with VX exposure. He did not have a cholinesterase (ChE) baseline because he was a trainee and was not supposed to go anywhere near the igloos and he did not explain why he thought he had been exposed to VX.

c (b)(7)(C) had a complete physical the next day because he had come in for his yearly physical. If I had thought there had been exposure I would normally reported the incident to the Emergency Operations Center but I did not report it.

d There has not been any rush of people running up to me concerned about their health.

3 (b)(7)(C) BGAD (b)(7)(C) and (b)(7)(C) (b)(7)(C) in testimony recorded on 11 October 2005 stated that to his knowledge, no one has been exposed to VX.

4 (b)(7)(C) and (b)(7)(C) Milan Army Ammunition Plant, and (b)(7)(C) BGCA (b)(7)(C), in recorded testimony obtained by telephone on 6 October 2005, stated that to the best of his knowledge, nobody at BGCA was exposed to VX.

5 (b)(7)(C) BGCA (b)(7)(C), in testimony recorded on 11 October 2005, stated that (b)(7)(D) (b)(7)(D)

6 (b)(7)(C) BGCA (b)(7)(C) and (b)(7)(C) (b)(7)(C) in testimony recorded on 11 October 2005, stated (b)(7)(D) (b)(7)(D)

7 (b)(7)(C) BGCA (b)(7)(C) and Complainant, in testimony recorded on 11 October 2005, stated (b)(7)(D) (b)(7)(D)

(2) Discussion.

(a) (b)(7)(C) complaint is that worker's lives and health were put in jeopardy due to the decision around September 2003 to remove the V to G conversion pads from the distal end of the sampling lines within the VX igloos and resultant adverse impact on the capability of the MINICAMS to detect VX. Since the decision to open the VX igloo doors is based on the MINICAMS readings (b)(7)(C) is concerned that agent workers may have been unknowingly exposed to VX agent. In September 2003, the V to G conversion pads were removed from the distal end of the MINICAMS sampling lines within the VX igloos. The V to G conversion pads convert VX to a G-analog which is more easily transportable and detectable through the Teflon sampling tubes. The V to G conversion pads remained installed at the end of the heated transfer lines outside the VX igloo. BGCA based their decision to remove the V to G conversion pads from the distal end of the sampling lines on a 1985 Southern Research Institute (SRI) study that indicated that the average transfer efficiency of VX through six feet of Teflon tubing without a V to G conversion pad was 86%. Refer to the discussion for Allegation 1 for more details. For purpose of addressing (b)(7)(C) concern

about workers' lives and health, the assertion that removal of the V to G conversion pads from the distal ends of the sampling lines within the VX igloos adversely impacted the capability of the MINICAMS to detect VX is valid.

(b) To determine if workers' lives and health had been put in jeopardy, a review of occupational health records was conducted to determine if there were any documented instances of VX nerve agent exposure. The Chemical Duty Position Rosters, Chemical Limited Area (CLA) access Roster, VX igloo entry logs, BGCA Type I Monitor Log Sheets - VX igloos, BGCA Medical Surveillance Matrix, Revision 1, and electronic mail correspondence from (b)(7)(C) BGCA (b)(7)(C) to (b)(7)(C) BGAD (b)(7)(C) dated 4 October 2005, 11:05 a.m., subject: CHEs for CAT II, were reviewed to determine personnel who were most at risk for VX exposure. These documents contained the names, duty positions, and/or medical surveillance categories of personnel who routinely entered the CLA or who routinely worked in and around the VX igloos. The BGCA Type I Monitor Log Sheets included the names of the RTAP MINICAMS operators who may or may not enter the VX igloos, but are present while the VX igloo doors are open. The BGCA Type I Monitor Log Sheets also contain the VX agent readings, if any.

(c) To determine circumstances where VX exposure would have been more likely to occur, the Emergency Operations Center (EOC) Daily Journals - VX igloos, were reviewed to determine if there were any unusual occurrences reported to the EOC during VX operations. Four unconfirmed MINICAMS reading of VX were noted: An unconfirmed reading of 0.29 Time Weighted Average (TWA) (0.0000029 mg/m^3) at igloo F407 on 8 January 2002; an unconfirmed MINICAMS reading of 0.30 TWA (0.0000030 mg/m^3) at igloo F104 on 14 March 2002; an unconfirmed MINICAMS reading of 0.27 TWA (0.0000027 mg/m^3) at igloo F207 on 30 September 2002; an unconfirmed MINICAMS reading of 0.29 TWA (0.0000029 mg/m^3) at igloo F102 on 30 September 2002. These readings were all at or below the no effects concentration limits of AR 385-61, which was the standard for allowable airborne exposures at the time of the occurrences. Also, it should be noted that these readings occurred prior to the V to G conversion pads being removed from the distal ends of the sampling lines within the VX igloos. No other unusual occurrences for VX operations were noted despite multiple VX igloo entries by both internal and external crews (e.g., Treaty Inspectors, Surety Management Review Teams, Kentucky Department of Environmental Protection, etc.).

(d) Eighty-six Standard Form (SF) 512's, Clinical Records - Plotting Charts were selected for review after determining who was most at risk for VX exposure. Depressions in acetyl cholinesterase (AChE) levels 10% or greater from baseline would be considered a presumptive indication of nerve agent exposure in accordance with both the 10 June 2003 and 8 June 2004 Interim Guidance documents. AChE depressions are plotted on the SF 512.

(e) Of the eighty-six Standard Form 512's reviewed, three dated 11 May 2000 indicated an AChE depression of less than 10% with annotations "rule out exposure":

(b)(7)(C) and (b)(7)(C), a (b)(7)(C) (b)(7)(C) and (b)(7)(C) an (b)(7)(C) had entered GB igloos F203 and F204 on 9 May 2000 and 10 May 2000, respectively. (b)(7)(C) an (b)(7)(C) was likely in the area during the GB operations. There is no record of these three individuals making entries into VX igloos on or about 11 May 2000. The evidence supports a conclusion that any AChE depression caused by nerve agent exposure would have been due to the individuals' work in and around GB, not VX. The AChE levels had returned to normal by 22 May 2000.

(f) Of 30 occupational health medical records, SF 600's, reviewed, there were four cases in which the medical records indicate the health clinic staff suspected nerve agent exposure: three dated 11 May 2000 as noted in the above paragraph and one dated 7 September 2005 fo(b)(7)(C) In the latter case, VX agent exposure, though unlikely, cannot be ruled out absolutely as the required medical evaluation for potential nerve agent exposure was not conducted by the health clinic in accordance with the 18 June Implementation Guidance/8 June 2004 Interim Guidance for Medical Practices and the local BGAD health clinic SOP for nerve agent exposure or potential exposure. (b)(7)(C) had not had a baseline AChE prior to being allowed into the Chemical Limited Area and no AChE had been established as of 3 October 2005. (b)(7)(C) access to the CLA was revoked by the BGCA (b)(7)(C) (b)(7)(C) on or about 3 October 2005 after the failure to establish an AChE baseline was noted. A review of (b)(7)(C) work activities on 6 September 2005 and 7 September 2005, an interview with (b)(7)(C) and review of VX igloo entry logs and BGCA Type I Monitor Logs for August 2005 and September 2005 indicate that (b)(7)(C) (b)(7)(C) had never entered a VX igloo or had been an RTAP/MINICAMS operator for any open-door VX operations. Review of MINICAMS operator certification records showed that (b)(7)(C) is qualified as a MINICAMS operator for GB, but is still in training to become qualified as a MINICAMS operator for VX. Therefore, any VX exposure would not be due to entering a VX igloo after faulty air monitoring. On 6 September 2005 (b)(7)(C) (b)(7)(C) had been practicing challenging MINICAMS with VX in an RTAP located at the BGCA laboratory area (Building 1661). On the evening of 6 September 2005, (b)(7)(C) (b)(7)(C) had started to feel ill with unusual sensitivity and sensations in his left arm and extreme fatigue. On 7 September 2005, (b)(7)(C) participated in a training exercise and was still feeling ill at the conclusion of the exercise. At the request of his supervisor, (b)(7)(C) (b)(7)(C) and due to personal concerns of blister agent exposure due to the types of symptoms he was experiencing in his left arm (b)(7)(C) reported to the BGAD Occupational Health Clinic. After explaining his symptoms to (b)(7)(C) (b)(7)(C) asked (b)(7)(C) if he had been exposed to any agent. (b)(7)(C) interpreted "exposed" to mean "worked around agent" and answered that the last agent he had been "exposed to" was VX on 6 September 2005. The medical record was therefore annotated: "Had VX exposed to VX yesterday." No further medical evaluation for VX exposure was conducted. During an interview with (b)(7)(C) and (b)(7)(C) on 5 October 2005, (b)(7)(C) stated he did not feel he had been exposed to VX if "exposure" meant skin contact or inhaling VX and that no VX vials had been broken when he was working with the MINICAMS.

(g) While conceding that during the timeframe the V to G conversion pads were not installed at the distal end of the sampling lines, an accurate reading of any VX low-level leaks could not be determined, no evidence exists to support a conclusion that workers' lives and health were endangered. The BGCA Type I Monitor Logs for September 2004 (when the V to G conversion pads were not installed at the distal end of the sampling lines) and September 2005 (when the V to G conversion pads had been re-installed at the distal end of the sampling lines) were compared. The Logs documented the same results: "ND" (no VX detected). The U.S. Army Chemical Materials Agency Presentations - Leak Occurrences in the U.S. Chemical Weapons Stockpile, Blue Grass Chemical Activity 1 January 1973 - 31 July 2005, Anniston Chemical Activity 1 January 1973 - 31 December 2004, Pine Bluff Chemical Activity 1 January 1973 - 31 December 2004, and Umatilla Chemical Depot 1 January 1973 - 31 December 2004 and the CMA VX Rocket Leaks database were reviewed to determine VX leakage history for VX rockets, 155mm projectiles, and VX rocket warheads. Throughout the U.S. stockpile, VX rockets, projectiles and warheads have a very low rate of leakage. One VX rocket leak (liquid) was recorded at BGCA in August of 1972. Since then, no VX leaks have been recorded at BGCA or PBCA. Anniston Chemical Activity has had five VX rocket leakers and 21 VX 155mm projectile leakers, all occurring prior to or during 1991. Umatilla Chemical Depot has had no VX rocket leakers, and two VX 155mm projectile leakers, with both VX 155mm VX projectile leakers occurring prior to 1985. The Deseret Chemical Depot, which has completed the demilitarization of its VX stockpile, recorded no VX rocket leaks. Johnston Atoll, now closed, recorded only four VX rocket leaks, all occurring prior to 1990. These records, plus the absence of any unusual occurrences noted on the EOC Daily Journals, provide support to the conclusion that the no-detect readings for VX vapor were ultimately accurate, though the MINICAMS was not configured properly.

(h) The characteristic nature of VX munitions to be non-leaking combined with visual first-entry monitoring, and the additional PPE requirements imposed by the BGCA (b)(7)(C) on 3 January 2005 mitigated the impact of any degradation in the capability of the MINICAMS to detect VX.

(3) Conclusion: The concern that workers' lives and health may have been jeopardized due to faulty air monitoring of VX igloos is **UNFOUNDED.**

j. Issue 5: (b)(7)(C) is concerned that VX may have escaped into the environment when VX igloo doors were opened due to incorrect V to G conversion pad placement resulting in faulty air monitoring data.

(1) Evidence:

(a) Standards:

1 Kentucky Administrative Regulations (KAR) Title 401, Natural Resources and Environmental Protection Cabinet, Department for Environmental Protections Chapter

34. Interim Status Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Sites or Facilities does not define when an airborne leak of VX occurs. The Blue Grass Army Depot and Blue Grass Chemical Activity have self defined the emergency reportable level for agent leaks at 25% (0.25) of the Short-Term Exposure Limit, which for VX equates to a confirmed releases at 0.0000025 mg/m^3 or above. The Blue Grass installation is currently under Interim Status.

2 Kentucky Administrative Regulations (KAR) Title 401, Natural Resources and Environmental Protection Cabinet, Department for Environmental Protections Chapter 34, Standards for Owners and Operators of Hazardous Waste Storage, Treatment, and Disposal Facilities defines a leak of commercial hazardous material as a detected leak of 10,000 parts per million or greater.

(b) Documentary Evidence:

1 As previously discussed, historical VX leaker data statistics compiled by the U.S. Army Materiel Command indicate that no VX leakers have occurred at BGCA since August 1972.

2 The BGCA Emergency Operations Center (EOC) Daily Journals since December 2000 were inspected and no confirmed readings of VX or other unusual events related to VX operations and VX igloo entries are noted in the EOC Daily Journals except for four unconfirmed detections of VX in calendar year 2002 that were at or below the no effects concentration standards of DA Pamphlet 385-61 in effect in 2002.

3 The September 2004 VX igloo monitoring data (when the V to G conversion pads were not installed at the distal end of the sampling lines) and the September 2005 VX igloo monitoring data (when the V to G conversion pads were installed at the distal end of the sampling lines) were inspected. Data for both September 2005 and September 2004 were non-detect for VX.

(c) Testimonial Evidence:

1 (b)(7)(C) BGCA (b)(7)(C) and previous (b)(7)(C), in recorded testimony obtained by telephone on 12 October 2005 stated that there has never been a leak of VX at the depot since he has been working there and he had been at BGCA since 1992.

2 (b)(7)(C) BGCA (b)(7)(C), in testimony recorded on 13 October 2005, stated that he had been at BGCA for 15 or 16 years and that they have never had a VX leaker and the rounds look good.

3 (b)(7)(C) BGCA (b)(7)(C) (b)(7)(C) in testimony recorded on 11 October 2005, stated (b)(7)(D) (b)(7)(D)

(2) Discussion: No evidence could be found to indicate that the VX munitions have leaked since August 1972. The MINICAMS technology was not available in 1972 and therefore, any leakage into the environment, if occurring, would not have been due to improper MINICAMS sampling configuration. The four reported MINICAMS detections of VX in 2002 occurred prior to the V to G conversion pads being removed from the sampling lines within the VX igloos and the readings were unconfirmed. Documentary and testimonial evidence support a conclusion that the VX munitions have not leaked at BGCA since August 1972 and therefore no VX agent has escaped into the environment due to the removal of the V to G conversion pads.

(3) Conclusion: The concern that VX may have escaped into the environment when VX igloo doors were opened due to incorrect V to G conversion pad placement resulting in faulty air monitoring data is **UNFOUNDED**.

k. **Issue 6**: (b)(7)(C) is concerned that the VX chemical agent air monitoring reports to Kentucky environmental offices and other organizations within and outside the Army have not been accurate.

(1) Evidence:

(a) Standards:

1 Kentucky Administrative Regulations (KAR) Title 401, Natural Resources and Environmental Protection Cabinet, Department for Environmental Protections Chapter 35. Interim Status Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Sites or Facilities require two types of reports to be submitted to the Kentucky Department of Environmental Protection (KDEP): An annual report due by 28 February of each year describing the facility hazardous waste activities during the previous calendar year and an "emergency" report where, for BGCA chemical agent operations, is defined as a confirmed agent release at 0.25 Short Term Exposure Limit (STEL). For VX, an emergency would be therefore be a confirmed release at 0.0000025 mg/m^3 or above. Emergency reports are due within 15 days of the conclusion of the event; i.e., when the agent igloo is returned to normal status - cleanup completed, munition overpack/transfer operations completed, additional filters removed, etc. Additionally, agent monitoring records must be kept listing the igloo locations, the monitoring equipment type and serial number, date of monitoring, the operator, and the monitoring results. Monitoring records must be kept on site for a period of three years and must be available for review on demand by the KDEP inspector, but are not required to be routinely submitted to KDEP.

2 Paragraph 3-7 of DA Pamphlet 385-61, Toxic Chemical Agent Safety Standards, 27 March 2002 requires detailed records of the results of monitoring conducted in support of operations for each day monitoring is conducted. Monitoring records must include the date, sample number, duration, location, and results of each sample taken; a

description of the sampling and analytical methods used, type of protective clothing and equipment used, and a roster of personnel entering the building/area. Records must be maintained in accordance with 29 Code of Federal Regulations (CFR) Part 1910, Section 1910.1020(d).

3 Title 29 Code of Federal Regulations 1910.1020(d), Occupational Safety and Health Administration (OSHA), Department of Labor, Occupational Safety and Health Standards, Subpart Z, Toxic and Hazardous Substances, Access to Employee Exposure and Medical Records, 1 July 2005, requires monitoring records be kept for a minimum of 30 years. Records must be available for review by OSHA inspectors, but are not required to be routinely submitted to OSHA.

(b) Documentary Evidence:

1 The BGAD Hazardous Waste Annual Report and Assessment Return For Report Year 2004, was submitted to KDEP as required on 15 February 2005.

2 In a letter dated 30 June 2005, the Kentucky Department of Environmental Protection, accepted the BGAD Hazardous Waste Annual Report and Assessment Return for Report Year 2004 as submitted.

3 The EOC Daily Journals from 18 December 2000 through September 2005 were reviewed. No confirmed VX leaks were documented at BGCA during this period; therefore, no emergency reports for VX have been required to be submitted to KDEP.

4 The BGCA Type I Monitor Log Sheets for VX igloos from September 2004 through September 2005 were reviewed in their entirety as well as a random sample from calendar years 2000 - 2005. The Log Sheets were correct as regards data items and format required by Title 401 of the Kentucky Administrative Rules, Chapter 35.

5 The BGCA Type I Monitor Log Sheets and igloo entry logs from September 2004 through September 2005 were reviewed in their entirety as well as a random sample from calendar years 2000 - 2005. The Log Sheets and entry logs contain the information required by DA Pamphlet 385-61 and are maintained in accordance with 29 CFR 1910.1020(d).

6 As discussed previously, historical VX leaker data statistics from 1971 to 2005 compiled by the U.S. Army Materiel Command were reviewed and revealed that no VX leakers have occurred at BGCA since August 1972.

7 The BGCA Emergency Operations Center (EOC) Daily Journals since December 2000 were inspected and no confirmed readings of VX or other unusual events related to VX operations and VX igloo entries are noted in the EOC Daily Journals except for four unconfirmed detections of VX in calendar year 2002 that were at or below the no effects concentration standards of DA Pamphlet 385-61 in effect in 2002.

8 The September 2004 VX igloo monitoring data (when the V to G conversion pads were not installed at the distal end of the sampling lines) and the September 2005 VX igloo monitoring data (when the V to G conversion pads were installed at the distal end of the sampling lines) were inspected. Data for both September 2005 and September 2004 were non-detect for VX.

9 The Army Depot Surveillance Record (DSR) for Rocket, Chemical Agent, 115mm, M55 VX, w/Fuze M417 Lot/Serial Number 2011-33-2162, records appropriate reporting and documenting of one VX rocket leaker to the Army in August 1972.

(c) Testimonial Evidence:

1 (b)(7)(C) BGCA (b)(7)(C) and previous (b)(7)(C) in recorded testimony obtained by telephone on 12 October 2005 stated that there has never been a leak of VX at the depot since he has been working there and he had been at BGCA since 1992.

2 (b)(7)(C) BGCA (b)(7)(C) in testimony recorded on 13 October 2005, stated that he had been at BGCA for 15 or 16 years and that they have never had a VX leaker and the rounds look good.

3 (b)(7)(C) BGCA (b)(7)(C) (b)(7)(C) in testimony recorded on 11 October 2005, stated (b)(7)(D) (b)(7)(D)

(2) Discussion: (b)(7)(C) complains VX igloo air monitoring reports to KDEP and other agencies within and outside the Army have not been accurate. The basis for his concern is that since the V to G conversion pads were removed from the distal ends of the unheated sample lines within the VX igloos, measurement of any airborne VX was inaccurate. Two types of reports are required to be submitted to KDEP by Title 410 of the Kentucky Administrative Rules, Chapter 35: an annual report and emergency reports for confirmed agent leakers. The 2004 annual report was submitted as required and accepted by KDEP. The applicable DSR card records appropriate reporting to the Army of the one VX rocket leaker occurring in August 1972. In 1972, all toxic chemical agent operations were classified and no report to state regulators was required. No VX leakers have been documented at BGCA/BGAD since 1972; therefore, no emergency reports have been required. Agent monitoring data is compiled and maintained by BGCA as required by Army and Federal regulations. The only issue is whether the no detect VX readings are accurate. No evidence exists to indicate otherwise. MINICAMS readings are supplemented by first entry visual monitoring. First entry monitoring visual inspections by BGCA, and multiple VX igloo entries by external organizations such as KDEP, the Army Materiel Command, the Defense Threat Reduction Agency, etc., have not uncovered any VX leakers. Any VX leaker occurrences would have been annotated in the EOC Daily Journals and/or the VX igloo entry logs. Additionally, monitoring data

compiled since 31 August 2005 when the re-installation of the V to G conversion pads on the distal ends of the sampling lines within the VX igloos was completed are still non-detect for VX. Historical VX leaker data compiled by the U.S. Army Chemical Materials Agency , the inherent low volatility of VX, lack of any visual evidence of VX leakage, and the continued no-detect MINICAMS results at VX igloos since the V to G conversion pads were re-installed provide support to the conclusion that the no detect monitoring data provided to KDEP and other organizations for the VX igloos has been correct.

(3) Conclusion: The concern that the VX chemical agent air monitoring reports to Kentucky environmental offices and other organizations within and outside the Army have not been accurate is **UNFOUNDED**.

7. Regulatory Violations Substantiated:

a. Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance (QA) Plan for Chemical Agent Air Monitoring, Revision 4, March 2003.

b. Chemical Agent Standard Analytical Reference Material (CASARM) Quality Assurance (QA) Plan for Chemical Agent Air Monitoring, Revision 5, November 2004, approved December 2004.

c. Chemical Materials Agency (CMA) Monitoring Concept Plan, June 2004.

8. Disposition: Recommend that this case be closed with no further action necessary. The BGCA Commander has taken the following corrective actions:

a. As of 31 August 2005, the V to G conversion pads have all been re-installed on the sampling lines within the VX igloos per CASARM and CMA standards.

b. As of 11 November 2005, additional management controls have been implemented restricting the decision-making authority of (b)(7)(C) BGCA (b)(7)(C) (b)(7)(C) and requiring Command review and written approval of any requests to change or waiver from established agent monitoring regulations, standards, and quality control plans prior to implementing changes.

c. A Letter of Concern has been issued to (b)(7)(C) and will remain in (b)(7)(C) personnel file for one year.

d. A Memorandum of Formal Counseling has been issued to (b)(7)(C) for failure to (b)(7)(C) laboratory operations.

9. Security Classification of Information: This report is **FOR OFFICIAL USE ONLY** as an Inspector General Report.

10. Location of Field Working Papers and Files: U.S. Army Inspector General Agency, 2511 Jefferson Davis Highway, NC-1, 12th Floor, Room 300, ATTN: SAIG-TI, Arlington, VA 22202.

11. Additional Notification Information:

a. Subject Addresses:

(b)(7)(C)

(b)(7)(C)

b. An Investigative Inquiry was conducted.

c. The Blue Grass Chemical Activity Commander was telephonically notified on 19 September 2005 and personally notified on 3 October 2005 that an Investigative Inquiry was to be conducted.

d. Name and address of (b)(7)(C)
Blue Grass Chemical Activity, 2091 Kingston Highway, ATTN: AMSCM-OPBG, Richmond, KY 40475-5008

Inspector General Hotline Case 97059/DIII 05-8278
U.S. Army Inspector General Agency
Technical Inspections Division

SUBMITTED:

(b)(7)(C)

Technical Inspections Division

DATE: 9 Dec 05

CONCURRENCE:

(b)(7)(C)

(b)(7)(C) Technical Inspections Division

DATE: 9 Dec 05

APPROVED:

(b)(7)(C)

The Inspector General

DATE: 6 FEB 06