DEPARTMENT OF THE ARMY
US ARMY INSTITUTE OF PUBLIC HEALTH
5158 BLACKHAWK ROAD
ABERDEEN PROVING GROUND MARYLAND 21010-5403

MCHB-IP-OHH

28 MAR 2014

MEMORANDUM FOR Program Manager (NSRD-BOO/Mr. Daniel R. Gregory), Close Combat Systems, Natick Soldier Research, Development and Engineering Center, 15 Kansas Street, Natick, Massachusetts 01760

SUBJECT: Health Hazard Assessment Report (RCS MED-388) No. S.0011068-14, Military Working Dog Equipment Set, 14 March 2014

1. This memorandum contains a copy of the subject report with an Executive Summary.

2. The Health Hazard Assessment Report (HHAR) contains an assessment of the health hazards identified during normal operation and maintenance of the materiel system, not resulting from a potential mishap or failure. Accordingly, safety or other Manpower and Personnel Integration (MANPRINT) domain assessments may conclude with different risk levels.

3. Provide the enclosed HHAR to System Safety, MANPRINT and Environment, Safety, and Occupational Health coordinators. Incorporate the identified health hazards and associated recommendations into MANPRINT and System Safety issue/hazard tracking logs. Use the HHAR to update the Programmatic Environment, Safety, and Occupational Health Evaluation (PESHE) and the Safety and Health Data Sheets (SHDS).

4. Provide the Army's Health Hazard Assessment (HHA) Program at this Institute with the results of risk mitigation and management decisions associated with the health hazards identified in this HHAR (e.g., SHDS, PESHE, MANPRINT Assessment, safety releases, and other appropriate documents).

5. Direct inquiries regarding the HHAR to the Army HHA Program Project Officer, Ms. Ruth Foutz, at commercial 410-436-2925, DSN 584-2925, or e-mail: ruth.m.foutz.civ@mail.mil.

FOR THE DIRECTOR:

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U.S. ARMY PUBLIC HEALTH COMMAND
5158 Blackhawk Road, Aberdeen Proving Ground, Maryland 21010-5403

HEALTH HAZARD ASSESSMENT REPORT (RCS MED-388)
NO. S.0011068-14
MILITARY WORKING DOG EQUIPMENT SET
14 MARCH 2014

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Health Hazard Assessment Report: 500A

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MCHB-IP-OHH

EXECUTIVE SUMMARY
HEALTH HAZARD ASSESSMENT REPORT (RCS MED-388)
NO. S.0011068-14
MILITARY WORKING DOG EQUIPMENT SET
14 MARCH 2014

1. PURPOSE. The Program Manager for Close Combat Systems at the Natick Soldier Research, Development and Engineering Center, Natick, Massachusetts, requested that the Army Institute of Public Health provide a Health Hazard Assessment Report (HHAR) for the Military Working Dog Equipment Set (MWD). This HHAR supports Full Material Release and related procurement requirements.

2. CONCLUSIONS. Risk Levels. This HHAR identifies one serious risk (acoustic energy (impulse noise)) and one medium risk (musculoskeletal trauma (lift and carry)) potential health hazard associated with the use and/or maintenance of the MWD.

3. RECOMMENDATIONS.

a. Acoustic Energy (Impulse Noise). A risk assessment code (RAC) of Serious (hazard severity (HS) 2, hazard probability (HP) C) is assigned. A residual RAC of Medium (HS 2, HP D) is assigned for compliance with the following recommendation: Place a warning in the training, technical, and operator manuals and directly on the case of the gunfire simulator requiring the use of single hearing protection by personnel positioned within 50 meters of the firing simulator.

b. Musculoskeletal Trauma (Lift and Carry). A RAC of Medium (HS 3, HP D) is assigned. A residual RAC of Medium (HS 3, HP E) is assigned for compliance with the following recommendation: Label each item described by the system developer according to the labeling requirements outlined in Table 2 in paragraph 6.b.(1)(c) of the full report, and include these requirements in associated technical and user manuals.

Health Hazard Assessment Report (RCS MED-388) No. S.0011068-14,
14 March 2014

TABLE OF CONTENTS

Paragraph Page

1. REFERENCES 1

2. PURPOSE 1

3. AUTHORITY 1

4. BACKGROUND 1

5. IDENTIFICATION OF HEALTH HAZARD ISSUES 2

6. HEALTH HAZARD ISSUES: ASSESSMENT AND RECOMMENDATIONS 2

7. PREPARER IDENTIFICATION 8

APPENDIX

A. REFERENCES A-1

HEALTH HAZARD ASSESSMENT REPORT (RCS MED-388)
NO. S.0011068-14
MILITARY WORKING DOG EQUIPMENT SET
14 MARCH 2014

1. REFERENCES. Appendix A contains a list of references used in this Health Hazard Assessment Report (HHAR).

2. PURPOSE. To determine the potential health hazards associated with the Military Working Dog Equipment Set (MWD). This HHAR supports Full Material Release and related procurement requirements.

3. AUTHORITY. The Army's Health Hazard Assessment (HHA) Program is an Army Medical Department initiative in cooperation with and in support of the Army acquisition process. The primary objective of the program is to identify and eliminate or control potential health hazards associated with the life cycle management of weapons, equipment, clothing, training devices, and other materiel systems. The proponent of the HHA Program is The Surgeon General (TSG) of the Army; however, TSG has designated the Army Institute of Public Health (AIPH) as the Lead Agent. The HHA Program provides support to materiel acquisition programs to ensure compliance with requirements contained in references 1 through 6.

4. BACKGROUND (references 7 through 11).

a. System Purpose. The MWD provides supplies and equipment to enable dog handlers and kennel masters to train, maintain, and employ working dogs for a variety of missions including specialized searches, patrol, explosives detection, mine detection, and patrol narcotics detection.

b. System Description. The MWD consists of four equipment kits: the Handler's Kit, Obedience Course Kit, Facilities Kit, and Handler's First Aid Kit. Each kit has specific items associated with it. The Handler's Kit consists of 30 items needed to manage the dog during missions (e.g., leashes, collars, muzzles, and harnesses). The Obedience Course Kit consists of seven items that are used to maintain the dogs' training during deployments. The Facilities Kit has 20 items associated with it that are used by kennel masters and handlers to train and maintain the health of the dogs in a kennel facility at a home station. The 56 items associated with the Handler's First Aid Kit are commercially available packaged in custom storage and carrying containers. Specific item lists for each kit can be found in the background references.

c. Previous Assessment. No previous HHARs on the MWD have been completed.

5. IDENTIFICATION OF HEALTH HAZARD ISSUES. Data requirements, health effects, medical criteria, and references specific to the health hazard types identified in this HHAR may be found at the following website: http://phc.amedd.army.mil/topics/workplacehealth/hha/Pages/default.aspx.

a. Acoustic Energy (Impulse Noise).

b. Musculoskeletal Trauma (Lift and Carry).

6. HEALTH HAZARD ISSUES: ASSESSMENT AND RECOMMENDATIONS. Department of Defense Instruction 6055.1 and Army Regulation 40-5 require that personnel not be exposed to health hazards in excess of the limits specified in the Department of Defense safety and occupational health standards or specialized standards applicable to military-unique equipment, systems, or operations (references 12 and 13). Every effort should be made to eliminate or control hazards through design.

a. Acoustic Energy (Impulse Noise).

(1) Assessment.

(a) Trauma to the ear, and consequently, a reduction in hearing ability, can occur with exposure to impulse noise in the absence of hearing protection devices. Hearing protection is required when impulse noise exceeds 140 decibels peak (dBP) pressure levels (reference 14). The primary source of impulse noise associated with the MWD is the firing of the 9 millimeter handgun simulator (Figure 1). Noise data was provided by the Aberdeen Test Center (ATC) at Aberdeen, Maryland (reference 15). For the 12 rounds fired, the highest peak pressures ranged from 169.1 to 173.4 decibels-peak and the B-durations ranged from 0.4 to 1.3 milliseconds. Using the equation for allowable number of rounds (ANOR) described in Military Standard (MIL-STD) 1474D and the data provided by ATC, the ANOR that can be safely fired per day using single hearing protection is 4,096. The noise levels identified were several decibels higher than expected. This is likely due to the positioning of the simulator close to the user's ear when being fired. The user points the simulator upward with the arm bent. No information was provided about noise contours. An earlier assessment of handgun noise identified a maximum contour distance of 23 meters (m) for a 45 caliber weapon (reference 16). As a conservative measure, a 50 m contour distance is recommended in the absence of noise contour data.

Figure 1. The MWD Gunfire Simulator

(b) Military working dogs will be exposed to the noise of the gunfire simulator. The information above has been provided to the Animal Medicine Program, AIPH. No further requirement concerning the noise exposure to the military working dogs is necessary at this time.

(2) Recommendations. A risk assessment code (RAC) of Serious (hazard severity (HS) 2, hazard probability (HP) C) is assigned. A residual RAC of Medium (HS 2, HP D) is assigned for compliance with the following recommendation: Place a warning in the training, technical, and operator manuals and directly on the case of the gunfire simulator requiring the use of single hearing protection by personnel positioned within 50 m of the firing simulator.

b. Musculoskeletal Trauma (Lift and Carry).

(1) Assessment. The potential musculoskeletal health hazard associated with the MWD is trauma from forceful exertions and non-neutral postures encountered while lifting, lowering, and carrying various system components. These forceful exertions and non-neutral postures can lead to a variety of musculoskeletal injuries resulting in a range of outcomes from performance decrement to permanent disability. The system developer identified 11 items (Figure 2) with weights exceeding 35 pounds that will be manually handled (reference 17). These items, which are primarily associated with the Obedience Course Kit, are listed in Table 1 with their respective weights. The system developer did not provide detailed information about the frequency or under what conditions these items will be lifted and carried. However, supporting documentation

suggests that these items will be packaged and delivered in crates for transportation and left stationary once the items are put in place (reference 11). Several items listed in Table 1 can be disassembled into several smaller pieces for transportation; however, for the purpose of this assessment, it is assumed that each item will be lifted and carried completely assembled. Weights of the smaller pieces were not provided by the system developer.

(a) The weight and perimeter of each item was considered in determining the appropriate number of lifters. It was assumed that none of the items listed will be carried further than 33 feet and lifted higher than 3 feet. Using the maximum design weight limits outlined in MIL-STD-1472G, paragraph 5.8.6.3 and the maximum permissible number of lifters equation in paragraph 5.8.6.3C for items requiring a lifting team, the recommended number of lifters was determined (reference 18). Hazard severity was determined by using the ratio of the maximum design weight limits and the actual item weights. The presence of other factors in the handling environment was used to determine hazard probabilities.

(b) This assessment was adjusted to predict the potential adverse health effects that may be encountered by a young, healthy Soldier possessing the strength capacity that is at least equal to that of a 50th percentile individual from the appropriate population performing unencumbered manual material handling. The data were evaluated to be applicable to a mixed gender population. For the purpose of this assessment, unencumbered lifting is defined as lifting performed in an area that does not constrain the movement of the lifter who is wearing a basic clothing ensemble without any other affixed loads such as body armor or a rucksack. Lifts performed in confined spaces or while wearing additional loads will elevate injury risk. Individuals with lower than the 50th percentile individual strength capacity may be unable to handle certain items or realize increased injury risk if they attempt to handle them. Individuals who demonstrate signs of overexertion such as discomfort, postural instability, or significant movement deviation should seek additional assistance to perform the lift.

(c) The recommended number of lifters and initial RACs for lifting and carrying each item is included in Table 1. Table 2 lists the labeling requirements for each item. This assessment assumes that personnel utilizing the MWD are trained on proper lifting techniques and wear appropriate protective equipment (i.e. gloves) when lifting and carrying the items. Failure to meet any of these requirements could increase injury risk. Be advised that in some instances the weight of the item in question was not provided by the system developer and was estimated based on a commercially available item.

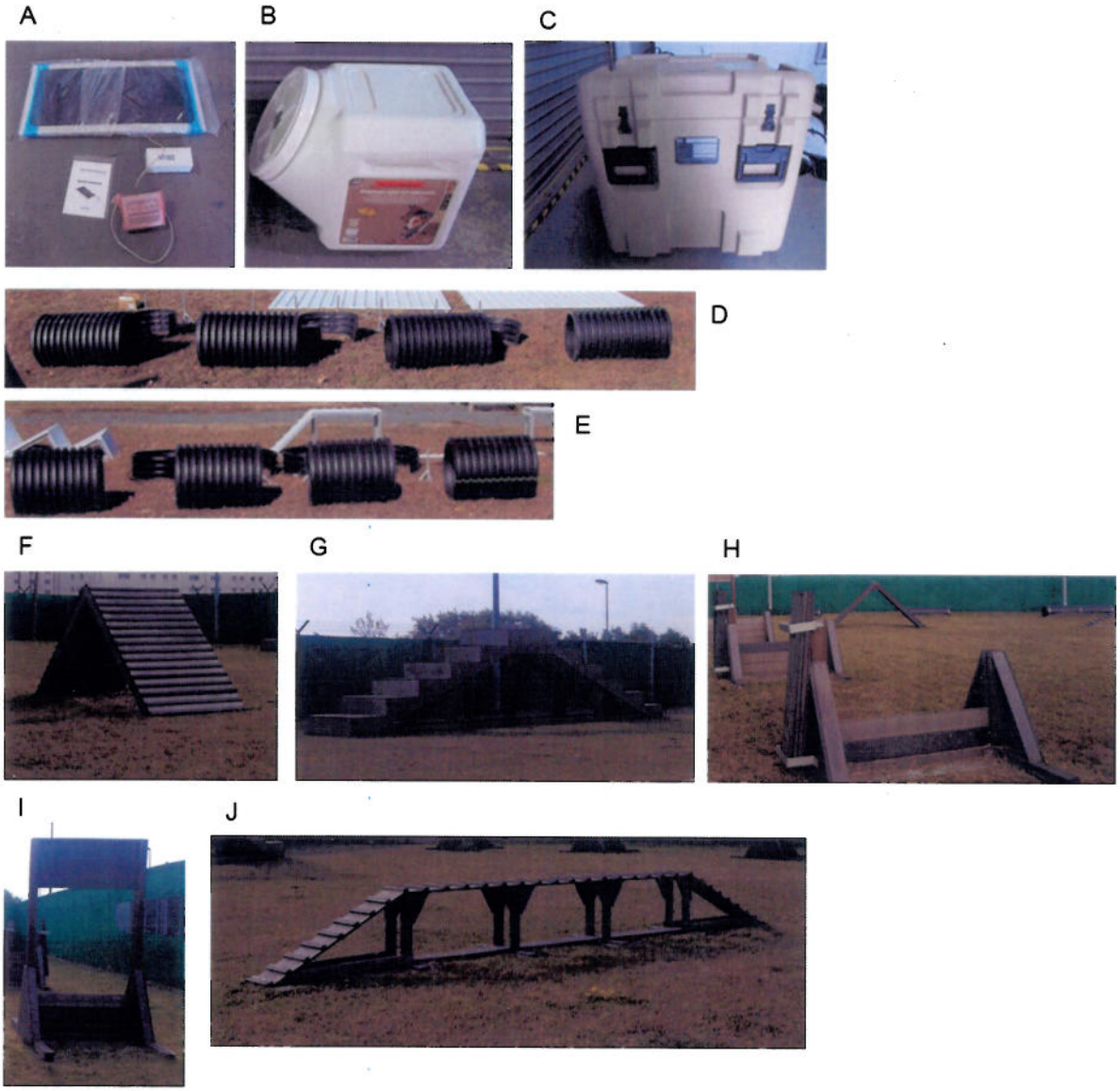

Figure 2. The MWD Components: A. Commercial Scale, B. Dog Food Container, C. Individual Dog Kennel Components, D. Long Tunnels, E. Short Tunnels, F. A-frame, G. Large Staircase, H. Hurdles with Panels, I. Jump Window with Panels, J. Catwalk (Not shown is the MWD Handler's Set).

Table 1. MWD Components

Item Name	Object Weight (Pounds)	Recommended Number of Lifters	Initial RAC (HS, HP)
Individual Dog Kennel Components	100	3	Medium (HS 3, HP E)
Commercial Scale	45	2	Low (HS 4, HP E)
Dog Food Container with Food	55	2	Low (HS 4, HP E)
MWD Handler's Set	90	2	Medium (HS 3, HP D)
Obedience Course Component – Long Tunnels	100	3	Medium (HS 3, HP D)
Obedience Course Component – Short Tunnels	70	2	Low (HS 4, HP D)
Obedience Course Component – A-frame	300	9	Medium (HS 3, HP D)
Obedience Course Component – Large Staircase	600	18	Medium (HS 3, HP D)
Obedience Course Component – Hurdles with Panels	120	4	Low (HS 4, HP D)
Obedience Course Component – Jump Window with Panels	150	4	Medium (HS 3, HP D)
Obedience Course Component – Catwalk	170	5	Medium (HS 3, HP D)

Table 2. Labeling Requirements for MWD Components

Item Name	Labeling Requirements
Individual Dog Kennel Components	This is a heavy item that should lifted/carried by at least three persons.
Commercial Scale	This is a heavy item that should be lifted/carried by two persons.
Dog Food Container with Food	This is a heavy item that should be lifted/carried carefully, especially when full.
MWD Handler's Set	This is a heavy item that should be lifted/carried by at least two persons.
Obedience Course Component – Long Tunnels	This is a heavy item that should be lifted/carried by at least three persons.
Obedience Course Component – Short Tunnels	This is a heavy item that should be lifted/carried by at least two persons.
Obedience Course Component – A-frame	This is a heavy item that should be lifted/carried by at least nine persons when repositioning and disassembled when transporting.
Obedience Course Component – Large Staircase	This is a heavy item that should be moved by a mechanical assist and/or disassembled prior to repositioning and transporting.
Obedience Course Component – Hurdles with Panels	This is a heavy item that should be lifted/carried by four or more persons.
Obedience Course Component – Jump Window with Panels	This is a heavy item that should be lifted/carried by four or more persons.
Obedience Course Component – Catwalk	This is a heavy item that should be lifted/carried by five or more persons.

(2) Recommendations. A RAC of Medium (HS 3, HP D) is assigned. A residual RAC of Medium (HS 3, HP E) is assigned for compliance with the following recommendation: Label each item described by the system developer according to the labeling requirements outlined in Table 2, and include these requirements in associated technical and user manuals.

7. PREPARER IDENTIFICATION. The AIPH, Aberdeen Proving Ground, MD 21010-5403, prepared this HHAR. The point of contact in the Army Health Hazard Assessment Program is Ms. Ruth Foutz, commercial 410-436-2925, DSN 584-2925, or e-mail: ruth.m.foutz.civ@mail.mil. This Institute's Ergonomics Program (Ms. Tricia Salzar) and Army Hearing Program (Mr. Charles Jokel) contributed to this HHAR.

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APPENDIX A

REFERENCES

1. Army Regulation 40-10, Health Hazard Assessment Program in Support of the Army Acquisition Process, 27 Jul 07.

2. Army Regulation 70-1, Army Acquisition Policy, 22 Jul 11.

3. Army Regulation 385-10, The Army Safety Program, 27 Nov 13.

4. Army Regulation 602-2, Manpower and Personnel Integration (MANPRINT) in the System Acquisition Process, 31 Jan 14.

5. Interim Department of Defense Instruction 5000.02, Operation of the Defense Acquisition System, 25 Nov 13.

6. Memorandum, Under Secretary of Defense, Acquisition, Technology, and Logistics, 23 Sep 04, subject: Defense Acquisition System Safety.

7. Memorandum, U.S. Army Research, Development, and Engineering Center, NSRD-BOO, 9 May 13, subject: Request for Determination of Health Hazard Assessment Report (HHAR), Military Working Dog Equipment Set for Full Materiel Release and Type Classification.

8. Description for Purchase, DFP-630, U.S. Army Armament Research, Development, and Engineering Center, Military Working Dog (MWD) Facilities Kit, 26 Oct 12.

9. Description for Purchase, DFP-655, U.S. Army Armament Research, Development, and Engineering Center, Military Working Dog (MWD) Handler First Aid Kit, 29 Oct 12.

10. Description for Purchase, DFP-628, U.S. Army Armament Research, Development, and Engineering Center, Military Working Dog (MWD) Handler's Kit, 8 Aug 12.

11. Description for Purchase, DFP-663, U.S. Army Armament Research, Development, and Engineering Center, Military Working Dog (MWD) Obedience Course Kit, 8 Aug 12.

12. Department of Defense Instruction 6055.1, DoD Safety and Occupational Health (SOH) Program, 19 Aug 98.

13. Army Regulation 40-5, Preventive Medicine, 25 May 07.

14. Military Standard 1474D, Department of Defense Design Criteria Standard, Noise Limits, 12 Feb 97.

15. E-mail, Test Director, U.S. Army Aberdeen Test Center, Clothing and Individual Protective Equipment, Mr. Bryan Hofferbert, subject: Noise data for the b-duration of impulse noise from simulator.

16. Memorandum, U.S. Army Institute of Public Health, MCHB-IP-OHH, 27 Aug 12, subject: Health Hazard Assessment Report (RCS MED-388) No. 69-MP-0ES6-12, USSOCOM Foreign Non-Standard Materiel Program.

17. E-mail, U.S. Army Institute of Public Health, MCHB-IP-OER, Ms. Tricia Salzar, 11 Mar 14, subject: MWD Equipment Set.

18. Military Standard 1472G, Department of Defense Criteria Standard, Human Engineering, 11 Jan 12.