
2021 ANNUAL REPORT

Biological and
Chemical Defence
Review Committee

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March 2022

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Biological and Chemical Defence Review Committee

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**2021 ANNUAL REPORT
BIOLOGICAL AND CHEMICAL DEFENCE
REVIEW COMMITTEE**

CONTENTS

INTRODUCTION	2
SUMMARY	4
COMMITTEE ACTIVITIES 2021.....	4
OBSERVATIONS.....	9
CONCLUSIONS	34
RECOMMENDATIONS.....	35
STATUS OF COMMITTEE RECOMMENDATIONS.....	35

INTRODUCTION

The policy of the Government of Canada is to press for global, comprehensive, and verifiable treaties banning all biological and chemical weapons. To this end, Canada is a State Party to the Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction (the Biological and Toxin Weapons Convention or BTWC) and, to the Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on their Destruction (the Chemical Weapons Convention or CWC).

However, for as long as the threat from such weapons endures, be they in the hands of state, or potentially, non-state actors, the Government has a recognized obligation to ensure that members of the Canadian Armed Forces (CAF) are equipped and trained to protect themselves from exposure to biological and chemical warfare (BCW) agents. Such protection is required not only during operational deployments abroad, but also in the context of military support to responses to terrorist incidents at home or other domestic emergencies involving these agents.

This said, the Canadian public, as well as the international community, have the right to be assured that the Government's policy of maintaining only a defensive capability in this field is fully respected and that any related research, development, or training activities undertaken are conducted in a professional manner with minimal risk to public safety or the environment.

To facilitate this assurance, the Minister of National Defence, in May 1990, directed the establishment of the Biological and Chemical Defence Review Committee (BCDRC or, "the Committee") as an adjunct to the Defence Science Advisory Board. Today, the BCDRC operates at arm's length from Government. Its mandate is to provide an independent, third-party review of the Biological and Chemical Defence (BCD) research, development and training activities undertaken by the Department of National Defence (DND) and the CAF with a view to assessing whether they are defensive in nature and conducted in a professional manner with minimal risk to public safety or the environment.

The BCDRC normally comprises three experts in scientific disciplines relevant to BCD such as chemistry, microbiology, and toxicology or neurology. One of these is selected by the Committee to serve as Chair. New members are appointed by the Chair based on nominations from such professional societies and associations as the Royal Society of Canada, the Canadian Society of Microbiologists, the Chemical Institute of Canada, the Society of Toxicology of Canada, and the Canadian Association for Neuroscience. The Chair also arranges for an administrative staff member to function as the Committee's Executive Officer.

Committee membership, as of 1 April 2021, was as follows:

Dr. Jonathan Van Hamme (Committee Chair)
Professor of Microbiology
Thompson Rivers University

Dr. Heather Durham
Professor of Neurology and Neurosurgery
Montreal Neurological Institute and Hospital
McGill University

Dr. Heinz-Bernhard Kraatz
Professor of Chemistry
University of Toronto

Brigadier-General (Ret'd) James Selbie serves as Executive Officer to the Committee.

The Committee's annual cycle of activity includes:

- Briefings in Ottawa on BCD issues by officials from National Defence Headquarters (NDHQ) and Global Affairs Canada (GAC)
- Visits to selected CAF education and training establishments, operational formations, and units where BCD activity takes place, and to associated government (mostly DND) research and development (R&D) facilities such as the Defence Research and Development Canada (DRDC) research centre at Suffield, Alberta (which we visit every year)
- Attendance at selected BCD exercises, training courses, workshops, seminars, symposia, *etc.*, conducted by the CAF or DND
- Publication in the public domain of an Annual Report with key observations, conclusions, and recommendations

The Committee's Annual Reports, dating back to 1991, are available on its website (www.bcdrc.ca). No report was produced in 2010 due to a delay in renewing the Committee's mandate.

The work of the Committee is funded by a contribution from the Government of Canada Department of National Defence.

SUMMARY

Having detected no evidence to the contrary during its 2021 visit and verification programme, the Committee concludes that:

- Canada's policy of maintaining a purely defensive biological and chemical warfare capability is fully respected by the DND and the CAF.
- The BCD research, development and training activities undertaken by the DND and the CAF are compliant with Canada's obligations as a State Party to the BTWC and to the CWC.
- The BCD research, development and training activities undertaken by the DND and the CAF, as observed by the Committee, pose minimal risk to public safety or the environment.
- There is no coyness or duplicity within the BCD program.

The Committee this year offers no new recommendations. We will continue, however, to pursue with DND and CAF authorities mutually satisfactory resolution of the three open recommendations made in previous Annual Reports.

COMMITTEE ACTIVITIES 2021

Last year, due to public health measures then in effect, we limited our activity to video-conferences (VTC) with the staff of those establishments contact with whom we considered essential to the discharge of our mandate. We were pleased to be able to return largely to a programme of physical visits during the fall of 2021 as indicated below. The Committee thanks the dedicated public servants and CAF members whose efforts permitted the resumption of in-person meetings conducted in compliance with COVID 19 safety protocols. We intend returning to the traditional spring visit schedule in 2022.

- **1st Canadian Air Division Headquarters (Winnipeg 1 November)** At 1 CAD HQ (which we last visited in 2017), we were greeted by the Deputy Commander and then met with the Headquarters' Force Protection Section staff who provided us a thorough update of the RCAF's operational-level BCD capability including RCAF organization; CBRN Defence policy and doctrine; assigned roles, missions, and tasks; current and anticipated equipment; and training. Given the Headquarters' NORAD role, we also were briefed on the Canadian NORAD Region including an explanation of the Region's CBRN warning and reporting function.
- **DRDC Suffield Research Centre (SRC) (Suffield 3-5 November)** Meeting with the Centre Director and staff we enjoyed a programme incorporating the following presentations and discussions:
 - an overview presentation and discussion of SRC's role, mission, and tasks; organization; infrastructure; resource allocation; staffing, notable activities and initiatives undertaken over the past year; inter-departmental and international involvements; and other issues of note including succession planning and the impact of the COVID 19 pandemic on operations
 - an overview presentation and discussion of the current BCD R&D program and associated projects underway at SRC including how contracted R&D mesh with in-house activities in pursuit of desired project outcomes
 - review of all BCD R&D contracts awarded to outside agencies
 - presentations by contractors engaged in contracted BCD R&D or by the Technical Authorities overseeing these contracts
 - visits to the Biological Threat Defence, Chemical Threat Defence and, Casualty Management Sections to include informal project briefings and laboratory visits with scientists
 - an update on the local development and implementation of the mandated Plan for Administrative Oversight of potential dual-use research of concern (DURC)
 - discussion of aspects of the BCW agent threat having a significant impact on current R&D activity
 - review and discussion of microbiological, viral and toxin holdings, including management protocols and procedures
 - visual inspection of Containment Level (CL) 2 microbiological, viral and toxin holdings and laboratory facilities
 - video inspection of selected holdings in CL 3 laboratory facilities

- review and discussion of chemical holdings, including management protocols and procedures
- visual/video inspections of chemical holdings and laboratory facilities
- an update on the Centre's compliance with the Controlled Drugs and Substances Act and its attendant regulations
- review and discussion of any transfers from SRC of chemical agents or pathogenic biological materials during the period 1 Oct 20 – 31 Oct 21, and procedures for the control and tracking of their use by the receiving agency
- presentation and discussion of the BCD training program and other activities at the Counter Terrorism Technology Centre
- an update on the application of the DRDC CBRN Risk Management Framework at SRC
- an update of the integration of the existing Health and Safety and Environmental Management Systems with DRDC's Corporate Safety and Environmental Management System
- review and discussion of the current safety program and related issues including:
 - follow-up action taken in response to the agent exposure occurrence reported to us in 2020,
 - a summary of biological or chemical hazardous occurrences or "near misses" over the past year and the action taken in response to same,
 - status of the implementation of the recommendations in the 2017 Fire Marshal's report,
 - implementation and exercise of the Integrated Emergency Response Plan,
 - status of the job hazard analysis reported last year,
 - the continued implementation of the Agent Worker Certification and acetylcholinesterase (AChE) surveillance programs, and
 - results of the external audit of the Safety and Environmental Management System.
- a separate private meeting with the General Safety Officer and each of the Chairs of the Biological and Chemical Safety Committees
- observation of a Chemical Threat Defence Section emergency response exercise

- a meeting with the CFB Suffield Medical Officer for the purpose of updating our understanding of the readiness of the Suffield Medical Section to respond to chemical or biological agent casualties
- review and discussion of the current infrastructure development program and other corporate services issues
- review and discussion of the current environmental management program including a separate private meeting with the Environmental Officer
- review and discussion of the discovery and disposal of any legacy munitions suspected to contain chemical or biological warfare agent
- review and discussion of the current physical and information security programs
- review and discussion of recent local developments in connection with relevant open recommendations contained in our 2020 Annual Report
- a meeting with the Base Commander
- a Committee debriefing of the Centre Director and his executive management team on preliminary observations and conclusions
- **DRDC Valcartier Research Centre (VRC) (Valcartier 16 November).** The Committee received an overview presentation on the VRC from the Centre Director as well as a tour of facilities and presentations on BCD-related projects in the realms of electro-optical signature exploitation and electro-optical tactical surveillance and reconnaissance. BCD R&D-related aspects of the Centre's environmental stewardship and health and safety programs were also discussed.
- **Directorate of Scientific and Technical Intelligence (NDHQ Ottawa 17 November)** The Committee was briefed on the current biological and chemical warfare agent threat assessment.
- **Assistant Deputy Minister (Policy) (NDHQ Ottawa 17 November).** With the assistance of GAC representatives, the Committee was updated on changes to the strategic security environment as well as the status of the CWC and BTWC, including an update on compliance by the DND and the CAF. The Committee was also briefed on recent biological and chemical weapons counter-proliferation support and other activities conducted under the auspices of the GAC-led Weapons Threat Reduction Program.
- **Canadian Joint Immediate Response Unit – CBRN (Trenton 17 November).** During our visit, the Committee was updated on the unit's role, mission, and tasks; employment concept; capability development; and training safety policy.

- **Canadian Forces Firefighting and CBRN Academy (Borden 19 November)** The Committee met with the Commanding Officer, Chief Instructor, and other staff who supplied an update on the Academy's BCD training program.
- **1st Canadian Field Hospital (Petawawa 22 November)** The Committee met with the Commanding Officer and staff who explained the hospital's capabilities and limitations with respect to the treatment of BCW agent casualties. We also viewed the transportable collective protection (COLPRO) system and discussed its utility.
- **Central Medical Equipment Depot (Petawawa 22 November)** The Committee met with the Commanding Officer and staff of the Depot and toured its pharmaceutical procurement, storage, packaging, and distribution facilities with an emphasis on arrangements for BCD-related medical countermeasures (MCM).
- **Directorate of Joint CBRN Defence (D JCBRN D) (NDHQ Ottawa 23 November)** The Director of JCBRN D updated the Committee on the role and organization of the Directorate; the status of the BCD equipment procurement projects; calls for R&D proposals; the evolution of policy and doctrine; and Exercise PRECISE RESPONSE – the live-agent training exercise for NATO nations normally held annually at SRC.
- **DRDC Centre for Security Science (NDHQ Ottawa 23 November)** The Committee received an update on the status of biological and chemical projects within the CBRNE Security line of effort of the Canadian Safety and Security Program (CSSP) as well as other Centre activities conducted with domestic and international partners.
- **Canadian Forces Health Services Group Headquarters (CFHS Group HQ) (Ottawa 24 November)**. The Committee was greeted by the Surgeon General and briefed by staff of the Operational Medicine Section on BCD-related activities over the past year including clinical training initiatives; R&D; international collaboration; regulatory affairs; and the status of the Strategic Medical Countermeasures Program (SMCP). The Committee's recommendation that consideration be given to the replacement and relocation of the Central Medical Equipment Depot (CMED) was also discussed.
- **DRDC Corporate Office (VTC 25 November)**. The Chief of Staff to the Assistant Deputy Minister (Defence Research and Development Canada) (ADM (DRDC)), chaired a VTC discussion of current issues with DRDC Corporate Office subject matter experts. Agenda items included an update on the implementation of the Defence and Security Science & Technology (DSST) Program; the CBRN defence and security lines of effort within the program; corporate, domestic, and international research delivery vehicles; support to the COVID -19 pandemic response; the status of responses to recommendations in the Committee's 2020

Annual Report; and preliminary observations made during the 2021 round of visits.

OBSERVATIONS

General. The Committee was warmly welcomed and received complete and proactive cooperation of authorities at all the headquarters, units, and agencies with whom we met. Presentations were relevant, focused, and detailed and the discussions that followed were free-flowing and transparent.

Threat. The briefings that the Committee received from Canadian Armed Forces Intelligence Command/Directorate of Scientific and Technical Intelligence attested to continued credible biological and chemical warfare threats from both state and non-state actors, which speak to the importance of reliable intelligence and appropriate defensive preparedness.

Defensive Capability. During its discussions with DND and CAF officials, the Committee had occasion to receive information and ask questions about capability requirements and procurement plans; R&D facilities and activity; in-service equipment and other materiel; doctrine; and training. In all instances, the Committee was satisfied that these pertained solely to the defensive functions of BCW threat assessment; agent detection, identification, and monitoring; information management (*e.g.*, warning and reporting); protection; hazard management (*e.g.*, decontamination); and MCM. The Committee assesses such functions as being consistent with the maintenance of a purely defensive capability.

Compliance with Policy and International Conventions

DND/CAF chemical and biological defence policy is set out in Defence Administrative Order and Directive (DAOD) 8006-0 (accessible on the Internet). Following our VTC with the DRDC Corporate Office on 25 November, the Committee received written certification from the Director-General R&D Science and Engineering, Director-General R&D Program and Acting ADM (DRDC) that the projects in the FY 2021-22 DRDC R&D program related to BCD, for which they are responsible, are compliant with the provisions of DAOD 8006-0 (CBRN Defence) and DAOD 8006-1 (CBRN Defence Operations, Training and Capability Development and Sustainment).

The Committee asks for and receives information on current R&D projects including those undertaken by DRDC contractors. This information includes detailed project descriptions, resource allocations and progress reports.

Occasionally, due to historical activities at CFB Suffield, legacy munitions meriting treatment as suspected historical legacy chemical weapons are found on the restricted-access experimental proving ground (EPG) or in the military training area at Suffield. These munitions are reported to NDHQ and the OPCW and permission is requested for

their destruction. The latest information the Committee has in this connection is the report of the destruction on 11 May 2016 of the suspect aerial spray tank discovered on 24 July 2015 and as noted in the BCDRC 2015 Annual Report. There have been no further discoveries since that date of which we are aware.

From time to time, the Organization for the Prohibition of Chemical Weapons (OPCW) conducts verification inspections of Canadian chemical defence R&D facilities. The most recent of these, two inspections of the Canadian National Single Small-scale Facility (CNSSSF) at the SRC, were conducted in September and October of 2019. During our visit, we examined the reports of both and determined that the OPCW inspection team raised no issues of concern.

Safety

Returning in person to SRC in November 2021, the Committee conducted physical inspections of CL2 microbiological and toxin holdings, and remote video inspections of CL3 bacterial holdings. These detected no significant issues although our discussion with the Centre's bioarchivist indicated that work to update the database of holdings continues. As previously reported, the toxin inventory requires further effort to validate the integrity of current stocks and ensure they align with current and future program requirements, integrate the inventory database with that of other biologicals, and establish ownership by current researchers (given that most of these stocks have not been used for some time). These efforts are in progress. A subset of toxins being used in current projects has been verified, aliquoted and catalogued.

Work is ongoing to update the following key publications:

- Standard Operating Procedure for Acquisition, Management, Accounting, and Usage of Risk Group 2 and Risk Group 3 Biomaterials and Toxins at DRDC Suffield
- Bio-security Manual
- Biological Laboratory Operating Manual (to ensure compliance with the provisions of the Human Pathogens and Toxins Act and with new Canadian Biosafety Standards)

The Committee completed remote video inspections of chemical holdings in the CNSSSF without issue. Last year, the Committee observed that control and accounting procedures for chemical holdings remain satisfactory, strengthened as they were in 2016 by the establishment of limits on the amount of agent that can be synthesized on strictly local authority, and by provisions for the tracking of the destruction of samples or sub-stocks of agent on completion of projects and exercises. The Committee continues to emphasize the importance of consistent compliance with the Centre's policy of recording agent use from "cradle to grave". Efforts to reduce old or surplus holdings are not without technical and administrative challenges – a state of affairs we will monitor.

This year we learned that significant renovations of the CNSSSF are required to comply with fire code requirements and that these are scheduled to occur during the summer of 2022. This will necessitate the transfer of Schedule 1, 2 and 3 chemicals to a temporary facility – a huge task for the Chemical Threat Defence Section and one that will require OPCW permission. It may also trigger an OPCW inspection. Significant and timely Public Services and Procurement Canada (PSPC) support will also be needed.

Agent Worker Certification program documentation has been updated, including changes to incorporate a broader range of agents, and is awaiting formal approval. Once published, it will be subject to a document control regime, thus addressing concerns raised by employees subsequent to the initial implementation of the program.

We verified that SRC's Controlled Substances Licence, granted in accordance with the Controlled Drugs and Substances Act, has been renewed to cover the period 01 August 2021 to 31 July 2024.

There were no transfers of chemical agents or pathogenic biological materials in or out of the Centre during the period 1 October 20 – 31 October 21.

Based on our discussions with the SRC General Safety Officer (GSO) and the Committee Chair, we believe the Biological Safety Committee continues to operate effectively. Vaccines relevant to current work are available to staff while a list of MCM thought to be similarly pertinent has been developed and supplied to local health care providers. Also, in accordance with laboratory licensing requirements, a training needs assessment for staff working in the CL2 and CL3 facilities has been submitted to the Public Health Agency of Canada and the Canadian Food Inspection Agency. Biological Safety Committee review and concurrence has now been incorporated as a step in the “on-line turbo approval process” (OnTAP) applicable to new R&D activity.

Last year, we heard concerns over the functioning of the Chemical Safety Committee. Items on the Committee's agenda had reportedly been left unresolved too long and the Committee's membership and terms of reference needed a refresh. The Chair of the Biological Safety Committee was “double-hatted” as Chair of the Chemical Safety Committee and the Chemical Safety Officer had only recently returned from parental leave.

The Chemical Safety Committee has since revised its terms of reference and membership and has made progress clearing its agenda of longstanding and/or impracticable action items. The current committee chair reports that the workload is manageable and that sub-committees comprising members from across the Centre possess sufficiently diverse expertise to be effective. The chair further explained that the committee has embarked upon a new and deliberate programme of work encompassing, *inter alia*, the following issues:

- updating of chemical safety-related standard operating procedures (SOP) such as those related to the conduct of field trials and the movement of agent from the CNSSF to other locations within SRC
- standardization of PPE and establishment of appropriate local holdings
- safe handling of high potency material
- fume hood safety
- modelling and safety templating of training scenario buildings at the Cameron Centre
- conduct of BCD training activities in Building 600 (Counter Terrorism Technology Centre) with a view to verifying training objectives and design, and emergency response procedures during training
- decontamination procedure during an emergency
- decontamination procedures and return policy pertinent to trainees' equipment that has come into contact with live-agent
- management of discharges from the wastewater lagoon at the Cameron Centre

In view of these actions, we will close as having been implemented, our 2020 recommendation that the terms of reference, composition, and operation of the Chemical Safety Committee be reviewed and, if necessary, modified to ensure that it effectively contributes to the maintenance of a safe workplace.

During our VTC with SRC in September 2020, we were informed of a February 2020 incident involving a chemical spill in Building 001. The affected area was decontaminated, and an employee was later transported to Medicine Hat Regional Hospital for over-night observation and released. This incident prompted an investigation by the Centre Director, the results of which were fully shared with us when we physically visited the Centre in November 2021. The investigation's findings pointed to deficiencies in practice, procedure, and building design as contributing to the cause of the incident and a response to it which, in some respects, was sub-optimal, at many levels.

Given the hazards in play at SRC, the critical importance of a universally embraced, comprehensive, pervasive, and adaptive safety culture, resistant to unintended erosion, cannot be overemphasized. It is notable that at its centre, this incident involved an experienced employee, reminding us that no one is immune from the temptations or consequences of departures from safety protocols. Accordingly, a key component of safety culture is the continuous monitoring of laboratory protocols aimed at ensuring they are equal to the task of countering existing or emergent hazards. A corollary of this vigilance is mutual accountability for adherence to safe laboratory practices at all times. These standard practices exist for a reason. To this end, we commend the stated intent of the new Chemical Safety Officer, as pandemic public health measures allow, to take part in the routine activities of the laboratories in order to develop good relationships with staff, observe laboratory practices at first-hand, respond informally to concerns, and assess safety culture.

This incident made more acutely apparent than ever before, the present-day inadequacies of Building 001 – the 66-year-old main laboratory and administration building at Suffield – and how these deficiencies heighten the risk of the occurrence of accidents of this sort and the possibility of consequent injury or death. The Committee has long underlined these inadequacies and recommended the acceleration of the project to modernize the biological and chemical research laboratories at SRC. The Independent Review Panel for Defence Acquisition has also emphasized the urgency of moving this project forward. We understand that the Associate Deputy Minister of National Defence, having been briefed on this incident by DRDC senior leadership, is seized of the same imperative. We can only hope that notwithstanding the widely reported impediments and setbacks that beset defence procurement, this project will now proceed swiftly to completion. DND's ADM (IE) has invited us to discuss this project when we next visit NDHQ. We welcome this opportunity and will share what we learn in our 2022 report.

A positive aspect of this incident was the highly proficient response by medical personnel from CFB Suffield and at the Medicine Hat Regional Hospital, reinforced by a subject matter expert from SRC's Casualty Management Section and the Centre's contracted medical advisor. That this was the case underlines the essential importance, as we have articulated in past reports, of maintaining an emergency medical response capability at Suffield tailored to its distinctive needs, including the provision of specialized CBRN clinical training to incoming medical staff and the preservation of a close professional relationship with the hospital emergency department and provincial first responders. Recent efforts to rebuild an integrated and knowledgeable response network are to be commended and must be continually reinforced through policies, SOP, and individual efforts.

On the topic of CBRN clinical training, this requirement is typically addressed by sending newly appointed Base Surgeons on selected UK or US CBRN medical training courses prior to their arrival in Suffield. Readers will recall that this procedure was disrupted by the temporary unavailability of the UK and US courses due to the impact of the pandemic. The Base Surgeon, in anticipation of her impending posting, took the initiative, with the support of medical authorities in the chain of command, to design and deliver to her replacement, a substitute, Canadian competency-based training course, combining curricula from the currently accredited courses and making use of the expertise and specialized training facilities available at SRC. The Centre's Medical Advisor told us this year that the course was well received and that in his opinion, it would be useful for medical personnel from point of injury to tertiary care. During our visit to CFHS Group HQ, we learned that while the *ad hoc* course was recognized as a success, resources were not available to institutionalize it and that for this reason, Canada would return to reliance on the out of country courses.

Also illustrated by this incident was the value of the recently implemented AChE monitoring program for chemical agent workers. As such, we were pleased to learn that program record keeping has been modernized, and that data is now entered in an encrypted, limited-access electronic system on a shared secure network drive. Efforts are being made to obtain a licence from Health Canada to use the technology (*i.e.*, the instrument) strictly for use as a monitoring tool, not a diagnostic one.

We observed an emergency response exercise executed by the Chemical Threat Defence Section in the containment hallway outside of the CNSSSF. This exercise was designed to test employees' response capability including identifying and overcoming obstacles. Participating in, or observing these exercises, will often crystalize in our minds, important considerations such as the need to secure incident sites for forensic sampling and thorough decontamination. Staff noted, given the absence of a working public address system in Building 001, the need for more hand-held radios. Moreover, at present, with many staff working from home, provision needs to be made for gaps in emergency response team rosters and the availability of "emergency managers".

Exercises are vital to the validation of SRC's Integrated Emergency Response Plan. Following a period of infrequent occurrence under the "work from home" regime, they will need to be conducted more often, as pandemic restrictions allow, to restore the efficiency and effectiveness of response. This is understood by SRC, with exercise planning now underway aimed at incorporating more comprehensive and challenging scenarios.

Following the chemical emergency response exercise, which we observed during our 2019 visit, fire department participants stated they would value more information with respect to the chemical hazards they could potentially encounter when responding to calls at SRC facilities. This concern related particularly to chemicals with elevated safety and security considerations. As a result, we recommended that authoritative information on the management of incidents involving unique risk factors at Suffield, be provided to first responders such that they may effectively and safely operate during an emergency. Such a reference document, titled, “Responding to an incident involving organophosphorus nerve agents – Safety advisory and guidance” (DRDC-RDDC-2021-D106), has been completed and approved for public release. A copy was shared with us when we visited DRDC Corporate Headquarters. It is an excellent paper, and we laud its DRDC authors for what we consider to be a valuable and timely contribution to public safety. We urge that it be widely distributed. Although we consider our recommendation closed, as having been implemented, we will continue to monitor its status. In view of this investment of scientific knowledge and experience, and the evolution of this family of agents and the guidelines for dealing with them, we also encourage DRDC to maintain the currency of this document and to communicate regularly to end-users its continued relevance, whether changes be made or not, in order to maintain confidence in its utility.

Progress has been made implementing the changes required by the 2017 Canadian Forces Fire Marshal’s Inspection Report. For example, fire doors, flammable and acid storage cabinets, and fridges and freezers for flammables and explosives, now meet the required specifications. Bulk solvents are now housed outside of Building 001 in an appropriate space. Plans are being developed for storage of opened materials and waste in Building 001 in designated locations (*e.g.*, designated fume hoods for waste jars which, when full, are removed from Building 001 for incineration) with the aim of eliminating long-term storage in Building 001. We look forward to future updates of this matter.

Given the nature of the R&D undertaken at SRC, the occupational health and potential emergency medical support needs of the Centre are specialized and complex. During past annual visits, we have become aware of several seemingly problematic aspects of the Centre’s situation in this regard and the challenges to which they, from time to time, give rise. We have also learned of the diligent and effective efforts of the many stakeholders involved to confront and overcome these challenges with a view to maintaining the completeness and consistency of the required support system. This said, we have also noticed a tendency for issues to re-emerge due to circumstances beyond local control, *e.g.*, contracting of medical advisors, changes in military medical personnel, treatment protocols, and the commercial availability of MCM.

These observations led to the inclusion in the Committee’s 2016 report, of the recommendation that an appropriate high-level authority, with the participation of relevant stakeholders, conduct a comprehensive assessment of occupational health and emergency medical support needs, including verification that these needs are being met.

The objective of this undertaking would be to ensure the long-term adequacy and stability of these essential supports to the work of SRC. We further suggested this same authority should take the lead in designing and implementing cooperative, long-term solutions to any gaps so identified.

In the years since, notwithstanding that this recommendation *per se* has not been acted upon, we have noted several substantial and enduring improvements, commendably effected locally by SRC, CFB Suffield, and others, with the support of regional and national level authorities. Foremost amongst these was the engagement of a Medical Advisor by SRC. We also commend, as indicated in the DND/CAF response to our 2019 Annual Report, the recent updating of the SRC's Health and Safety Management System manual, (and which is being subsumed in the new DRDC Corporate Safety and Environmental Management System equivalent); the initiative to undertake a Job Hazard Analysis of all positions; and the revision of the Centre's Integrated Emergency Response Plan. Consequently, our major concerns have been alleviated – at least temporarily.

We continue to believe, however, that the components of an occupational health program and emergency medical response capability, which meet the unique needs of SRC should be locally defined and strongly supported at the Corporate level. These components could be incorporated into a tool such as the existing SRC Risk Management Framework to allow for monitoring and the flagging of deficiencies to the responsible authority. Moreover, where appropriate, these components should be cemented in place by officially promulgated policy or formal agreements between parties, including non-DND or non-CAF entities, to avoid slippage and dependence on specific personal relationships. As we stated in last year's report, as soon as the first of these steps is completed, the Committee would be inclined to close the recommendation as having been superseded by other actions. During our November visit, we viewed the first draft of such a framework. We consider it a good start but will wait until it is finalized before committing to closing our recommendation.

On a related note, we believe that this framework would lend itself to tracking the relevance and currency of the numerous health, safety, and environmental protection SOP in force at SRC.

A number of occupational health and safety topics came to our attention this year. Foremost amongst these, was concern over the risk borne and accumulated by civilian personnel involved in live-agent training activities at the Cameron Centre (*e.g.*, safety officers and decontamination team members). Specific issues include:

- should civilians be required to endure the same risks as military members during live-agent training?
- the transitory risk faced by military members compared to longer exposures and accumulated risk experienced by civilian staff
- risk threshold definitions, assessment, and monitoring

- modelling and risk assessment of training scenarios including real-time environmental modelling
- differences in military and civilian operating concepts
- matching appropriate PPE to specific hazards and risks
- requirement for the inclusion of periods of rest during training
- health-related decision-making during field exercises
- approaches for collecting and storing data on individual activities over a career

The Head of the Chemical Threat Defence Section and the Chemical Safety Officer are championing the need to address this concern. It is argued that an adequately resourced, bespoke integrated health and safety system is required for the benefit of civilians involved in live-agent training. We expect to hear more in future visits.

There has been, for some time, a requirement to conduct a Job Hazard Analysis at SRC in support of employee health and safety. The GSO explained that a plan has been devised to contract a Registered Industrial Hygienist to conduct this analysis for all positions during FY 2022-23.

Similarly, the Centre lacks a Respiratory Protection Program applicable to its employees, as required by law. Work to design and implement a compliant program has started and its completion assigned high priority. We will ask for a progress report when next we visit.

The GSO reported that a common factor present in several biological and chemical “near misses” in recent years, has been fume hood malfunction. He explained that fume hood standards, regulations, and SOP are the responsibility of ADM (IE), and that SRC scientists find these deficient or problematic due to a lack of understanding by central authorities of their conditions of use and attendant hazards in an environment like Suffield. This lack of understanding can result in delays to necessary repairs. SRC staff will attempt to mitigate this situation by means of a campaign to educate their ADM (IE) colleagues with respect to local requirements.

We were told that the OnTAP review process has revealed no case of Dual Use Research of Concern (DURC). SRC staff remain mindful of the requirement to identify same by means of the application of the mandated Plan for Administrative Oversight for DURC.

SRC’s Casualty Management Section is housed in Building 010 - a structure separate and at a distance from Building 001. As we reported last year, significant renovations to the building have been launched to address instances of non-compliance with Canadian Council on Animal Care (CCAC) standards; in particular, the requirement for separation of laboratories and offices from the vivarium and the separation of species therein. However, work is not proceeding as quickly as planned. The CCAC has agreed, in consideration that the project is underway, to extend the facility’s probationary status for

one year to allow critical training and research activity to continue subject to quarterly reports of progress toward completion of the renovations.

The Committee heard construction of a new neurobehavioural facility – again separate from Building 001 – has been approved with completion forecast for 2026 or 2027.

Environmental Protection

The SRC Acting Environmental Officer reviewed the various environmental management programs, which include environmental impact assessments; species at risk; wastewater; halocarbons; air emissions; hazardous material; storage tanks; spill prevention and response; and contaminated sites risk management.

Generally, these programs are operating effectively and efficiently.

We were reminded that environmental review is required for every new field trial and all trial renewals, and that this requirement is built into SRC's OnTAP.

In accordance with the stipulations of DRDC's Corporate Safety and Environmental Management System, the SRC Health and Safety and Environmental Management Systems were recently integrated. Defence Construction Canada carried out an external compliance audit of the integrated system in September 2019. While the system received a passing mark, thirteen items of "non-conformance" were identified and a further thirteen observations made. While most of these have been alleviated, certain environmental management issues have yet to be resolved. We have asked for a copy of the audit report and will ask about these in future meetings with the GSO and the Environmental Officer.

The Environmental Officer did acknowledge that two programs require closer attention – species at risk stewardship and contaminated sites risk management. The former would benefit from updated or additional surveys of potentially impacted species in the Experimental Proving Ground, while the latter is afflicted by the overlapping and shifting of responsibilities and authorities held by SRC, the DRDC Corporate Office, and the Director of Contaminated Sites at NDHQ. We will pursue these topics when we visit in 2022.

Other Observations

- **1st Canadian Air Division Headquarters**
 - RCAF and US Army Canadian NORAD Region (CANR) personnel at 1 CAD HQ provided the Committee with comprehensive and thorough presentations that led to productive discussions illustrating the dedication and enthusiasm with which the small group of force protection staff embrace their secondary CBRN defence roles.
 - The Committee observed that staff redundancy, continuity, and overlap are important to facilitate corporate knowledge transfer, (including command

reporting structures, roles, and responsibilities), and to ensure that CBRN tasks are not left unattended. At present, there is a single US Army Chemical Corps officer assigned to the CANR staff. The incumbent believes that given the extent of CBRN tasks and this officer's concurrent duty as Chief of Staff, a second CBRN position should be established.

- Continued focus on ensuring adequate equipment supplies for domestic training and participation in international exercises is critical. The Committee was pleased to hear of positive relationships between force protection staff at 1 CAD HQ and the Canadian Forces Fire and CBRN Academy (CFFCA), where a collaborative approach is being taken to improve CBRN defence training schedules and seat availability based on fluctuating needs.
- With CBRN defence policy, doctrine, direction, and guidance now in place and a considerable quantity of new equipment in the system, the challenge facing the RCAF will be one of sustaining the positions, personnel, and training needed to operate this capability.
- The Committee hopes to visit the RCAF's 2 Air Expeditionary Wing in Bagotville, Quebec in 2022 in order to update our understanding of the application of policy, doctrine, equipment, and training at the tactical level.
- **SRC/CFB Suffield**
 - The Committee recognizes the acute challenges faced at SRC since the outset of the COVID-19 emergency, both in managing a suddenly dispersed and vulnerable workforce and in responding to a surge of requests for aid from defence and public health entities. We commend everyone - managers, scientists, technologists, and support staff alike - for the courage, adaptability, and determination they have displayed in putting their expertise and facilities at the disposal of the nation while implementing and conforming with measures to guard the health of all employees.
 - Notwithstanding persuasive pandemic-related restrictions and impediments, we believe the Centre pivoted in impressive fashion to focus its capabilities on counter-COVID-19 activities. These have included:
 - support to medical intelligence
 - anti-viral research
 - provision of diagnostic capability support to Canadian Forces Health Services
 - measurement of the continued effectiveness of the N95 mask after repeated reuse and after sanitization measures

- two important publications: “The impact of extreme reuse and extended wear conditions on protection provided by a surgical-style N95 filtering facepiece respirator”, published in the Journal of Occupational and Environmental Hygiene (“paper of the year”) <https://doi.org/10.1080/15459624.2020.1829633>, ; and a second paper, “The protective performance of reusable cloth face masks, disposable procedure masks, KN95 masks and N95 respirators: Filtration and total inward leakage”, published in the journal PLOS ONE, available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8494377/#>.
- provision of advice related to the transmission of the virus, diagnostics, personal protective equipment, and decontamination
- This year we met with some of the SRC scientists who went beyond their normal duties to respond to CAF needs for SARS-CoV-2 testing by rapidly establishing a world-class high-throughput testing facility at Suffield. In so doing, they expanded on the use of nasal swabs, and developed and validated a less invasive saline gargle method for sampling. The exploitation of existing national and international relationships and multilateral agreements was instrumental to the admirable success of this endeavour.
- In 2019, the Committee observed that maintenance of the required level of knowledge, skill, and experience amongst the research and support staff at the SRC is a formidable task. The retirement of experienced and knowledgeable staff without replacement, together with the Centre’s aging infrastructure, remain the leading risks to the execution of its mission.

- An orderly succession plan, including the timely hiring and training of new staff, constitutes the obvious mitigation strategy for the “retirement risk”. Overlap with retirees preserves critically important corporate memory and ensures continuity of operations. Succession planning is a complex problem involving the forecasting of retirements and absences; recruiting; security clearances; deployment; training; knowledge transfer; depth and redundancy of expertise; and budgets. There may also be safety and staff morale aspects to consider. In certain instances, positions left vacant or filled by underqualified persons could constitute non-compliance with legal requirements. DRDC leaders are aware of these problems and are actively seeking solutions. Given its safety dimension, we believe this matter falls within our mandate and, as such, recommended in our 2019 Annual Report that senior leaders take note of this issue, carefully examine its components, and then redouble their efforts to implement an enduring solution. We credit DRDC for its effective initial response to this recommendation. All forecast retirements at SRC have been reviewed and approved for replacement, with inclusion of a hand-over period for those positions with unique and critical knowledge and skillsets. While several positions have been filled, it remains difficult to hire people into positions that require extensive knowledge and/or expertise – often due to the relatively remote location of the Centre. The time required to issue security clearances to new employees is significant, and managers are hard-pressed to carry out hiring functions while executing their other supervisory duties. As such, section heads spoke of the value they attach to the understanding and support of corporate human resources authorities. This said, the Centre Director shared that the civilian human resource function is under stress throughout DND.
- Notwithstanding these challenges, during our November visit, we were happy to learn of signs of success in addressing some of the most critical pressure points as found in the Chemical Threat Defence Section. In 2020, we were informed of a proposal to restructure this section to accentuate and strengthen its vital ancillary functions - that of agent synthesis, and of oversight, including “cradle to grave” management of chemical holdings and enforcement of the provisions of the CNSSF and Controlled Substances Act licences.
- Indeed, the Section has since been reorganized and reinforced with new staff, including a long sought-after chemical engineer, and a new Ph.D. level synthetic chemist; however, the search continues for two additional chemists and a research technologist.

- The Section's reorganization incorporates a new CWC regulatory compliance framework centered on a Regulatory Compliance Officer. This officer is responsible to the Section Head and Centre Director for all aspects of CNSSSF, Schedule 1, 2, and 3 Chemical holding, and Controlled Substances licence requirements and obligations. These arrangements constitute the full implementation of the compliance management concept shared with the Committee in 2020.
- It is fair to say that staffing of positions at SRC will always merit close attention. We believe, however, that the acute concerns that led to our 2019 recommendation have been addressed and that we can close this recommendation as having been implemented.
- The Committee heard that within the limitations of the physical infrastructure of SRC, physical and information security programs are compliant with applicable policy. Improving the Centre's capability and capacity for secure computing and communications remains a priority objective given its "reach-back" support role, and the "new normal" of less travel and more on-line meetings. Accordingly, work has started on a new secure VTC facility with completion to occur not later than 2024.
- Productive relations between SRC and CFB Suffield authorities are essential to the success of their respective missions. As in recent years, our meetings with the Base Commander, the Centre Director, the Corporate Services Manager and other SRC staff have been denoted by a common refrain, that being that relations are good and growing stronger with a focus on common goals and mutually beneficial outcomes. Specifically, we noted the report of close collaboration on pandemic response and that the service level agreement (SLA) between the base and SRC is entrenched and will be reviewed regularly. We were told, however, that health services are no longer included in this SLA. A separate agreement is being negotiated, and in the meantime, the provision of health services will continue in accordance with the old agreement. The base has lost its preventative medical technician and pharmacy. It will be important to determine how these services will be provided in future.
- Dependable, high quality radio communications linking users of the Experimental Proving Ground with Suffield range control and emergency first responders are critically important to the maintenance of safety and security. The existing system is showing its age and so we were pleased to hear of upgrades to the communications backbone (Safety Emergency Administrative Radio System (SEARS)), and that SRC is transitioning to a digital system for its internal use.

- We were told that the working relationship between CFB Suffield, SRC and the local Real Property Operations office is much improved, with the latter having developed a better understanding of the specialized functions and requirements of SRC.
- Problems with SRC's backup power supply persist.
- The Centre Director acknowledged that the procurement cell is overwhelmed, and that this situation is a source of frustration for scientists whose work is slowed or halted due to a lack of supplies.
- We have always been impressed by the live-agent training that occurs at the Cameron Centre in support of the readiness of the national CBRNE team; elements of the CAF; NATO partners; other friendly nations; and in the past, Canadian domestic first responders. We heard that SRC is open to a larger training role assuming money and specialist personnel are available. This said, it is argued, and we agree, that there should be a separate baseline of funding for training as opposed to funding within the same envelope as R&D activities.
- **DRDC Valcartier Research Centre**
 - We received an excellent overview of the science and technology R&D roles played by VRC in the context of the CAF's BCD operational needs – especially with respect to stand-off detection and monitoring. Progress in these areas is impressive and illustrates the effective partnership that exists between the expert scientists and technologists at Valcartier, and their counterparts elsewhere in DRDC; in academia and industry; and in Allied nations. The effects of the pandemic have forced the cancellation of certain field trials scheduled to occur in the US; however, it is hoped these will resume in 2022.
 - In contrast to the worrying infrastructure situation at Suffield, we were encouraged to learn that a new consolidated and state of the art laboratory facility will open there in 2024 with the number of structures comprising the Centre being reduced from 154 to eight. It will be interesting to observe the remediation and re-naturalization of the land formerly occupied by the old buildings.
 - It is clear that occupational health and safety are the top priority at VRC. This necessitates not only the constant attention of leaders and managers but also, recognition that operation of the safety and environmental management system needs to be adequately resourced and designed in such a way that it does not unduly divert scientists and technologists from their work.
 - As at SRC, staffing and procurement are concerns. Having said that, VRC has found that an active student placement program and attention to the career

development of Defence Scientists can help mitigate the impact of retirements.

- **CF Intelligence Command, ADM (Policy) and Global Affairs Canada**
 - As in previous years, transparency and frankness typified our talks with intelligence and policy staff at NDHQ and with personnel from GAC. They provided briefings not only on the threat landscape and the status of the BTWC and CWC, but also, as they have generously done before, the Weapons Threat Reduction Program (WTRP), which encapsulates Canadian activities undertaken in support of our country's membership in the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction.
 - As stated earlier in this report, the briefings we received from the intelligence staff attested to continued credible BCW agent threats from both state and non-state actors, which necessitate appropriate defensive preparedness. We were informed that the monitoring and ongoing assessment of the threat landscape relies upon the expertise of an exceedingly small number of experts whose ranks further diminished this year due to retirement. During our visits to the DRDC Corporate Office, we have heard expressed the desire for more CBRN intelligence input to the formulation of the R&D program and that the ability to infer adversarial intent deserves more attention. Moreover, as the international norms around the prohibited use of biological and chemical weapons continue to come under erosive pressure from malign actors, the specialized threat analysis capability of CFINTCOM seems to us to be increasingly important. As such, the Committee believes that an enhancement of Canada's ability to assess biological and chemical threats would be welcome.
 - As a State Party to the BTWC, Canada is obliged to:
 - neither develop, possess, nor acquire biological weapons (BW) nor facilitate their production by another
 - put in place national implementation legislation, extending the BW prohibition to citizens
 - provide assistance if another State is attacked with a BW
 - provide fullest possible exchange in the life sciences
 - GAC officials told us that the following issues continue to limit the effectiveness of the BTWC or otherwise give rise to concern:
 - lack of universality of adherence – 14 states remain outside the Convention and not all States Parties have effectively implemented it
 - lack of the institutional infrastructure and verification regime possessed by

the CWC – instead, it essentially relies on good-faith adherence by States. (A three-person Implementation Support Unit serves as treaty secretariat and “declaration” of confidence building measures (CBM) by States improves transparency by sharing information on CL4 laboratories, biological defence research programs, disease outbreaks that deviate from normal patterns, scientific publications of relevance, a declaration of past offensive programs post-1946, and vaccine production capacity. Canada regularly submits CBMs and makes them available to the public.)

- financial viability – lack of a working capital fund
 - Dual-use Research – increasingly, biological research intended for peaceful purposes could be misused or exploited to develop or to produce biological weapons. It is becoming increasingly difficult to prevent biological weapons proliferation without impeding research in the life sciences. We were pleased to hear this year that Canada now funds a position in the World Health Organization dedicated to this issue.
- We also heard that Canada intends to reassert itself in the BTWC process leveraging lessons identified during the COVID-19 pandemic.
 - The CWC is a global disarmament treaty that bans development, production, acquisition, stockpiling, retention, transfer, and use of Chemical Weapons (CW). It has provisions for declarations and inspections of CW production facilities, and oversees the destruction of CW and CW production facilities.
 - The Organisation for the Prohibition of Chemical Weapons (OPCW) administers the Convention and operates a comprehensive verification scheme which incorporates declarations of compliance; on-site inspections of permitted facilities that produce, process, or consume, import, or export certain listed chemicals; and investigations of allegations of use of CW. The OPCW records that 98% of all States Parties’ declared CW has been destroyed.
 - 2022 will see completion of the construction of a new OPCW Centre for Chemistry and Technology to serve as a knowledge repository, laboratory, and training centre. Drawn from GAC’s Weapons Threat Reduction Program, Canada’s contribution to the Centre’s construction and operation is the largest of any single nation.
 - The Coordinator, Canadian National Authority (CWC), outlined for the Committee, Canadian declarations of compliance with the Convention and provided a list of current licenses for the use of chemicals subject to the CWC control regime.
 - We remain impressed by the WTRP and the extent of its projects and activities undertaken in conjunction with partner countries, international organizations,

NGOs, and other government departments aimed at mitigating threats posed by CBRN weapons and related materials. Key activities are prevention, detection, and response to weapons of mass destruction threats; securing or destroying dangerous CBRN materials; improvement of security at facilities; strengthening of global networks; and building partner capacity to meet international obligations.

- With respect to BW, the WTRP pursues collaboration between the security and health sectors at the “health-security” interface where respective interests and responsibilities coincide *i.e.*, strengthened public health capability to respond to natural outbreaks equals strengthened preparedness for deliberate outbreaks. We were thus most interested this year to learn of the remarkable extent of programming in support of efforts to prevent, detect and respond to COVID-19 including the funding of infectious disease early warning systems, laboratories and testing facilities, vaccines and PPE in Africa, the Middle East, and the Caribbean.
- Regarding CW, the Program has previously contributed markedly to the destruction of weapons in Russia, Libya, and Syria. Currently, the focus is on the provision of assistance to and through international organizations such as INTERPOL and the OPCW and to at-risk countries such as Jordan and Iraq to enhance their capabilities to prevent, detect and respond to the use or threat of use of CW or weaponized toxic chemicals by states or non-state actors. Within Canada, GAC is expanding its collaboration with DND and the CAF with GAC funding for the delivery of CBRN defence training to the Malaysian Armed Forces and GAC involvement in the Chemical Security Community of Practice initiated by DRDC’s Centre for Security Science cited as examples.
- **Canadian Joint Immediate Response Unit – CBRN (CJIRU-CBRN)**
 - The programme assembled this year by the Commanding Officer and his staff allowed us not only to strengthen our understanding of CJIRU force employment and development concept and direction, but also to gain a better awareness of its interaction with DRDC and some of the medical dimensions of its preparedness for operations. We were also pleased to view equipment displays and speak with several operators who, once again, impressed us with their expertise, professionalism, dedication, and maturity. As during past visits, we appreciated the openness and candour that denoted the presentations and answers to our questions. Our opinion of the unit remains high and our perception of the essential value of its contribution to the security and defence of Canada is reinforced.
 - One particularly interesting aspect of our discussion was the potential value to the unit’s knowledge base and also to the sum of knowledge of the BCD R&D

community to be derived from the inclusion in the unit's establishment of a Ph.D.-level scientist — even if only on a part-time or consultancy basis. Such a person could both contribute to and benefit from CJIRU's innovative engagement with CBRNE matters. We understand that the unit is actively pursuing this initiative.

- Another topic was the value of liaison officers (LO) to the exchange of knowledge (“reach-back”) and the coordination of operations. Apparently, the CJIRU LO position at SRC is not currently filled nor is there a DRDC LO position in the unit – to the detriment of both organizations. Also, CJIRU stressed the excellent value of having a Canadian LO located with the NATO CBRN Centre of Excellence (COE) in Vyškov, Czech Republic to provide direct access to relevant NATO datasets. The Committee understands that there is a Canadian officer posted to the COE from the Directorate of Joint CBRN Defence.
- Finally, we learned that, unsurprisingly, CJIRU tremendously values the live-agent training opportunities available at Suffield but is always keen to explore the potential for more challenging scenarios within the bounds of adequately managed risk.
- **Canadian Forces Firefighting and CBRN Academy**
 - In FY 2021-22, the CFFCA expects to conduct fourteen CBRN Defence courses with 274 graduates with twenty-two courses and 376 graduates forecast for FY 2022-23.
 - We were pleased to learn that the CBRN defence wing of the Academy now has 17 of 19 of its authorized staff positions filled including a bio-science officer. There is still, however, a shortage of French speaking instructors.
 - The updating of qualification standards, training plans and courseware continues with the help of qualified contractors and a permanent training development cell. More on-line course modules and distance learning options are being included.
 - The entry into service of the new personnel, combat equipment and vehicle decontamination system is aided by user observations submitted to relevant authorities by the Academy.
 - It was also emphasized that any training courses “exported” for conduct by field units – as is, from time to time, requested – must be authorized and regulated by a Service Level Agreement. A standard SLA is in development.
 - The Academy will offer a Joint Effects Modelling course starting as soon as 2023.

- The Academy admits being challenged by the existence of over-lapping responsibilities and authorities between Military Personnel Generation Group, D JCBRN D and the Navy, Army and Air Force with respect to individual training, prioritization, advertisement, and coordination.

- **1st Canadian Field Hospital**

In our 2019 report, we closed as having been implemented, our recommendation that Canadian Forces Health Services Group should clarify its expectations of 1 Canadian Field Hospital with respect to the Hospital's capability to operate in a BCD environment including the provision of treatment to biological and chemical warfare agent casualties. During this year's visit, we perceived that there may again be uncertainty around these expectations. We also discerned that doubts persist concerning the utility of the transportable collective protection (COLPRO) system issued some years ago to the Hospital under the CBRN defence omnibus equipment project.

- **Central Medical Equipment Depot**

- This year's visit allowed the Committee to reinforce its understanding of limitations on the CMED's further progress toward Good Manufacturing Practices (GMP) accreditation — a status essential to the Depot's qualification to import or export drugs and to collaborate with PHAC on the potential provision of reciprocal back-up capability for the storage and distribution of MCM and other medical items. As we learned during our visit in 2017, the presence on staff of a long-sought quality assurance specialist has served to illuminate several issues standing in the way of accreditation — most of these relate to the age and condition of the existing warehouse. It was reported to us then that the mission-essential air-conditioning system dated to 1960 and was subject to break-down. Asbestos was present; installation records pertaining to fixtures, fittings and utilities were absent; and the temperature-control alarm system was prone to malfunction. A related challenge was finding suppliers willing to serve the Depot's relatively remote location with refrigerated tractor-trailer combinations equipped with temperature-control systems meeting the exacting GMP standards.
- With respect to potential collaboration with PHAC, we have been told in the past that PHAC considers not only lack of GMP accreditation to be an impediment, but so too, the Depot's distance from a major airfield.
- These observations led us to recommend in 2017 the replacement and relocation of this facility — a recommendation which has been well received by DND/CAF (and by PHAC) but which, we understand, for funding reasons, will take some time to implement.

- In the meantime, as we learned during this year's visit, renovations to mitigate the shortfalls of the existing facility continue, including an upgraded adjacent room equipped with new freezers and the construction of a GMP-certifiable room, which would permit exchange of products with PHAC.
- These mitigation measures, as commendable as they are, represent a short term and only partial solution. We remain strong in our opinion that the location, condition, and capacity of the CMED merit its replacement and relocation noting that the direction of the Strategic Medical Countermeasures Program (SCMP) suggests that even more demands will soon be placed on this unit. This said, we were impressed by the interim measures that have, or will soon be implemented at the Depot to address the most pressing concerns over condition and capacity.
- **Directorate of Joint CBRN Defence**
 - The Army's D JCBRN D is responsible for the development of joint CBRN defence capabilities to enable the armed forces to survive and operate in a CBRN-contaminated environment at home or abroad. In this connection, one of its principal tasks is the provision of guidance to DRDC with respect to the BCD R&D program. The Directorate is most helpful to the work of the Committee, supplying us, as it does an overview of BCD-related policy, doctrine, equipment, personnel, and training matters. We were pleased to meet the Director who supplied a thorough and insightful update of the Directorate's recent activities and current issues pertaining to capability development and the provision of operational and strategic-level advice and support. We understand that with the completion of the omnibus equipment procurement project, the Directorate is focused on eliciting from appropriate authorities and stakeholders, a renewal of the policy and doctrine framework for CBRN defence as well as the establishment and operation of better mechanisms for the management of training and the identification of new equipment requirements. Based on our observations, we endorse these objectives.

- Exercise PRECISE RESPONSE is an annual three-week duration CBRN live-agent training exercise held at SRC's Counter Terrorism and Technology Centre in support of NATO and with average participation of 400-450 personnel from twelve nations and the OPCW.
- D JCBRN D directs the exercise and coordinates participation, training requirements, and funding (from Canadian and NATO sources).
- The focus of the exercise is on small teams working in a multi-national, interoperable context to execute the functions of a CBRN defence task force, including tactical command and control; detection, sampling, and identification; handling evidence; contamination control; and casualty extraction.
- The nature of this exercise constitutes a unique and highly valued Canadian contribution to not only NATO's CBRN defence capability but so too, that of international organizations such as the OPCW with interest in participation continuing to grow.
- The impact of the COVID-19 pandemic necessitated cancellation of Exercise PRECISE RESPONSE in 2020 and 2021, however, planning is underway for the return of this activity in 2022.
- **DRDC Centre for Security Science**
 - The Canadian Safety and Security Program (CSSP) traces its origins to the aftermath of the September 2001 terrorist attacks. The Program, co-managed by the CSS and Public Safety Canada, not only remains relevant, but it also compellingly demonstrates the leverage to be gained from modest expenditures when these are coordinated with other agencies and Allied nations in pursuit of common interests across public safety, national security and even defence domain boundaries.
 - We received an overview of the public safety and national security roles of the CSS with a focus on CBRNE security. It was informative to see the science and technology program cycle and management tools, as well as the outcomes and objectives in the CBRNE security line of effort. The description of key projects closed since 2020, ongoing projects (including project extensions due to COVID-19), new projects, and projects recommended for funding, provided a strong indication of how the CSS responds to emerging threats. The importance of domestic and international partnerships (*e.g.*, the Quadrilateral Group on Chemical, Biological, and Radiological Counterterrorism (the "QUAD"); and the Canada-US Irregular Warfare Technical Support Directorate (IWTSD)) for knowledge and burden sharing was illustrated. These relationships are central to deploying science in times of national need. In this

context, it should be highlighted that the CSS and their partners shifted quickly to respond to COVID-19 in a meaningful, valuable, and commendable way.

- **CFHS Group HQ**

- We were pleased this year to meet the new Head of the Operational Medical Section who joined us during our visits to 1st Canadian Field Hospital and CMED.
- Regarding CBRN clinical training, it was explained that the in-house course developed in Suffield in 2020 was successful as an expedient response to the strictures arising from the pandemic and can be repeated as needed. However, it was further stated that the cost of permanently institutionalizing the course was prohibitive and that as restrictions are raised, Canadian medical personnel would, as a rule, attend UK and US training courses.
- International collaboration continues within two frameworks. The first is that of NATO's Committee of Chiefs of Medical Services (COMEDS) where contributions are made to the CBRN Medical Working Group which conducts "deep dive" CBRN medical risk assessments and capability gap analysis. The second framework is that provided by the Chemical, Biological and Radiological Memorandum of Understanding (CBR MOU) between Australia, Canada, the United Kingdom, and the United States within which the CBRN Medical Counter Measures Consortium operates, and research and capability development efforts are coordinated.
- Notable R&D activities currently under the direction of CFHS include plague vaccine, evaluation of potential prophylaxis against SARS CoV-2, and new auto-injectors.
- In our view, Regulatory Affairs remains proactive, diligent, and effective in ensuring adherence to Health Canada and DND regulations and policies for the reporting, accounting, and handling of unlicensed medical products; advising on regulations for their use; and seeking regulatory approval for them, where feasible. The section is also effective in providing product development support to the Strategic Medical Countermeasures Program (SCMP), DRDC research, the Medical Countermeasures Consortium, manufacturers, and allies. We also commend their involvement in the whole-of-government effort around pandemic preparedness and response.
- The SMCP is progressing well with the principal concern now being the capacity of the CMED to store the soon to be procured stocks of MCM. It is estimated that the Depot will be out of space by 2028/29. Commercial storage offers a short-term solution, but one that may not be suited for Surgeon General controlled products.

- We remain strong in our support of the need to replace and relocate the CMED but understand this may not occur for many years – the project being 18th on the relevant list of CAF infrastructure priorities. In the meantime, we are happy that renovations to bring the laboratory and storage facilities to as close to GMP standards as possible are nearing completion. We commend the efforts of CFHS Group to address the risk to which this situation gives rise, and hope that the current heightened public awareness of the importance of appropriate medical equipment and pharmaceutical supply and distribution facilities will be of benefit in this connection.
- **DRDC Corporate Office**
 - We were told that the transition to the new Defence and Security Science & Technology Program (DSST) launched in 2020 is going well. CBRN Defence is a Line of Effort within the Program’s so-called “People” Strategic Focus Area (SFA). There is also CBRN-related activity in the “Domestic Security” SFA aimed at enabling safety and security and led by the CSS (as described above).
 - The objective of R&D on the CBRN Defence Line of Effort is to enable the CAF to conduct operations, with agility and effectiveness, in any domestic, continental, or international environment where there is a risk or threat of the use or release of CBRN material, with a focus on new and emerging threats including pharmaceutical-based agents.
 - The scope of such R&D comprises:
 - provision of critical evidence-based information on CBRN threats/hazards to enable planning and development of policy, doctrine, and tactics
 - delivery of enabling, integrated technologies that provide rapid detection, identification, and monitoring of CBRN threats/hazards
 - development of protection technologies that minimize the harm to personnel, equipment, and infrastructure from exposure to CBRN material
 - provision of specialized CBRN training and reach-back capability as needed to support CAF operations
 - provision of science and technology to mitigate and reduce the immediate and long-term health effects of exposure to these hazards
 - Specific investments are, or will be made, in the following areas:
 - risk analyses on CBRN threats/hazards and capability gap assessments
 - threat characterization
 - support to acquisition to fill any immediate capability gaps for CBRN detection

- novel technologies for rapid detection, identification, and monitoring of CBRN threats/hazards
- development of innovative materials, systems, and prototypes for next generation combat uniforms
- development of technologies for decontamination and hazard management
- individual and collective CBRN training including live-agent and live-tissue
- support to operations, including reach-back expertise
- MCM against biological threats (broad spectrum)
- MCM against chemical threats
- diagnostic technologies
- novel platforms for MCM development
- DRDC delivers CBRN research via the following vehicles:
 - DRDC Research Centres at Suffield and Valcartier, and the DRDC Centre for Security Science for joint public safety and security requirements
 - National innovation programs including the Innovation for Defence Excellence and Security Program (IDeAS) and Innovation Solutions Canada (ISC)
 - Public Health Agency of Canada National Microbiology Laboratory in the case of animal efficacy studies for counter-COVID MCM
 - National Research Council in the case of novel chemical and biological agent sensor work

- SLAs/MOUs with other Government departments, industry, and academia
- The CBR MOU between Australia, Canada, the United States, and the United Kingdom remains DRDC's primary mechanism for chemical and biological defence strategic alignment and collaboration with Allies. Working groups in the threat and hazard assessment (Assess), decision-making support (Inform), and physical protection, decontamination, and medical countermeasures (Protect) domains identify research and development tasks and coordinate their execution by the member nations. An additional working group, with the inclusion of Sweden, has been recently formed to address the threat posed by pharmaceutical-based agents.
- Tri-lateral MOU exist, or are planned, with Sweden and the Netherlands for research into aspects of biological and chemical hazard assessment, safer handling of highly toxic compounds, and the medical management of chemical casualties.
- Canada is also cooperating with the UK and the Netherlands on the development of a new nerve agent countermeasure.
- Finally, we again commend DRDC for the way it has activated its resources and expertise in response to the COVID-19 pandemic, be it assisting the CAF, leveraging ongoing investments, helping to mobilize industry or funding near-to-market solutions, or contributing to international initiatives through existing partnerships.

CONCLUSIONS

Having detected no evidence to the contrary during its 2021 visit and briefings, the Committee concludes that:

- Canada's policy of maintaining a purely defensive biological and chemical warfare capability is fully respected by the DND and the CAF.
- The BCD research, development and training activities undertaken by DND and the CAF are fully compliant with Canada's obligations as a State Party to the BTWC and CWC.
- The BCD research, development and training activities undertaken by DND and the CAF pose minimal risk to public safety or the environment.
- There is no covertness or duplicity within the BCD program.

RECOMMENDATIONS

The Committee this year offers no new recommendation. We will continue, however, to pursue with DND and CAF authorities the mutually satisfactory resolution of the three open recommendations made in the reports of previous years.

STATUS OF COMMITTEE RECOMMENDATIONS

Please see Annex A for DND/CAF responses to Committee recommendations.

ANNEXES

A – Status of Committee Recommendations

B – Acronyms and Abbreviations

STATUS OF COMMITTEE RECOMMENDATIONS

1. **(2014)** *We encourage acceleration of the final approval and funding of the project to replace DRDC Suffield's BSL 3 suites in Building 1 in an expedient manner compatible with safe continuation of the biological program in both the short and long term. [This recommendation has been reworded to better reflect the situation in 2019]*

DND/CAF Response (July 2015): "During 2014, DRDC reviewed the original 2004 requirement and has invested significant effort to revise the Statement of Requirement (SOR), update the project identification documents (SS(ID)), and review the main options for presentation to a senior review board (SRB) in April 2015. This will be the first official stage in getting what amounts to a new \$14M project into the DND infrastructure investment plan."

BCDRC Comment (December 2015): We commend this effort and will closely monitor further progress of this vital undertaking. In the meantime, we urge that the maintenance of critical systems in Building 1 continue to receive diligent attention.

DND/CAF Response (September 2016): "DND/CAF has initiated a process for the replacement of the biological laboratories at the DRDC Suffield Research Centre for handling of risk group 2 and 3 biological agents. This project has been identified in internal development and acquisition plans and is undergoing options analysis and review. Taking into account administrative processes, the anticipated timeline to update existing facilities is 3-5 years. While this process continues, DRDC continues to exercise its extensive preventative maintenance program."

BCDRC Comment (December 2016): We acknowledge the additional complications introduced by the transfer of real property responsibilities to ADM IE but continue to urge priority attention to this project. We will continue to monitor and report progress.

DND/CAF Response (April 2017): "During the transfer of responsibilities to ADM (IE), the review of outstanding infrastructure projects resulted in a significant improvement in the recapitalization of the Suffield Chemical and Biological Laboratories as it has become the highest rated ADM(S&T) project within the ADM(IE) major construction queue. While it still remains in the unfunded queue, it is expected that this improvement will result in concrete action in the near future. The interim replacement of the biological laboratories continues through the capital equipment program."

BCDRC Comment (December 2017): Continuing to see, as we do, serious infrastructure issues, we applaud the appointment of a Project Manager who will be instrumental to moving the project forward.

DND/CAF Response (April 2018): "During the transfer of responsibilities to ADM (IE), the review of outstanding infrastructure projects resulted in a significant improvement in the recapitalization of the Suffield Chemical and Biological Laboratories, as it has become the highest rated ADM (S&T) project within the ADM (IE) major construction queue. While it

ANNEX A
to BCDRC 2021 Annual Report

still remains in the unfunded queue, it is expected that this improvement will result in concrete action in the near future. The interim replacement of the biological laboratories continues through the capital equipment program; a Statement of Requirements is currently being drafted for this replacement.”

BCDRC Comment (December 2018): While both projects are gaining momentum, there is concern that despite their intimate connection, the MBCF project risks becoming de-linked from the longer-range laboratory re-capitalization (which is ranked as DND’s number one priority project within its price range). Were this to occur and the MBCF project abandoned, the continuity of the biological defence programme would be threatened, given the likelihood that the aging current bio-containment facility will fail before the laboratory recapitalization project is completed. The lack of a bio-containment facility at SRC, even temporarily, would jeopardize Canada’s ability to meet its domestic responsibilities and international commitments.

DND/CAF Response (February 2019): “During the transfer of responsibilities to ADM (IE), the review of outstanding infrastructure projects resulted in a significant improvement in the recapitalization of the Suffield Chemical and Biological Laboratories, as it has become the highest rated ADM (S&T) project within the ADM (IE) major construction queue. While it still remains in the unfunded queue, it is expected that this improvement will result in concrete action in the near future. SRC was visited by ADM (IE)’s Project Director for SRC’s recapitalization project and a member of his support team from Defence Construction Canada to meet key staff and discuss the information needed over the next 24 months that will form the package required to enable project definition. The interim replacement of the biological laboratories continues through the major capital equipment program; however, there are currently insufficient human resources within ADM (S&T) to complete the requirements needed to advance progress to the next stage with ADM (Mat).”

BCDRC Comment (December 2019): At DRDC Corporate Office, the Committee was updated on potential strategies for the replacement of the aging Containment Level 3 suites. The recommendation will remain open. The Committee will continue to stress the critical importance of infrastructure renewal to safety of operations and continuation of the programs.

DND/CAF Response (April 2020): “The efforts towards recapitalization of the Suffield Chemical and Biological Laboratories (Recap) are continuing, with the ‘Identification’ and ‘Options Analysis’ phases occurring to develop a Statement of Requirements and cost estimation, respectively. This is planned to occur over a 24-month period beginning in Fall 2020. Both of these will result in the selection of a course of action for the ‘Design’ phase. Additionally, a site for the new facility has been selected and approved. With Recap now advanced, its timeline is converging with that anticipated for the Modular Bio Containment Facility (MBCF). As such, options for coordinating the two efforts are currently under consideration.”

ANNEX A
to BCDRC 2021 Annual Report

BCDRC Comment (December 2020): This year, we were told that the separate MBCF project has been side-lined in favour of building the new laboratory complex, possibly in stages. The rationale for this change is that the planned completion date for the two projects has been converging with the MBCF due to be commissioned only a few years before the larger project. The new, unified endeavour is titled the Laboratory Modernization Project. A modified site has been selected and contracts for preliminary studies (environmental impact, topographic, geophysical, *etc.*) have been awarded. Current estimated cost is \$275-350M with occupancy anticipated to occur within 12-15 years. Given this timeline, contingency plans for catastrophic failure of the existing infrastructure are apparently being developed. We will be interested to learn more about these plans as we believe that it is likely the aging biocontainment facility will fail before the modernization project is completed. The lack of a such a facility at SRC, even temporarily, would jeopardize Canada's ability to meet its domestic responsibilities and international commitments.

DND/CAF Response (April 2021): "The efforts towards the Modernize Chemical and Biological Research Laboratories DRDC Suffield project are continuing. The 'Identification' and 'Options Analysis' phases to develop a Statement of Requirements and cost estimation, respectively, are planned over a 24-month period via contract which has been awarded. The contractor that will carry out this work is currently completing the security process. Both phases will result in the selection of a course of action for the 'Design' phase. The Modular Bio Containment Facility (MBCF) project is currently on hold since the Modernize project is making progress. Both projects draw on the same scientific staff. Their timelines are converging and their commissioning is expected to be a few months apart. The Independent Review Panel for Defence Acquisition (IRPDA) provided advice on the 'Modernize' project, which resulted in bolstering the project documents with a better description of the capability gaps. The Panel also emphasized the urgency of moving this project forward with an accelerated timeline, if possible."

BCDRC Comment (December 2021): The February 2020 chemical spill incident made more acutely apparent than ever before, the present-day inadequacies of the design of the 66-year-old main laboratory/administration building at Suffield - and how these deficiencies heighten the risk of the occurrence of accidents of this sort and the possibility of consequent serious injury or death. The Committee has long underlined these inadequacies and recommended the acceleration of the project to modernize the biological and chemical research laboratories at SRC. The Independent Review Panel for Defence Acquisition has also emphasized the urgency of moving this project forward. We understand that the Associate Deputy Minister of National Defence having been briefed on this incident by DRDC senior leadership, is now seized of the same imperative. We therefore hope this project will proceed swiftly to completion. DND's ADM (IE) has invited us to discuss this project when we next visit NDHQ. We welcome this opportunity and will share what we learn in our 2022 report.

DND/CAF Response (August 2022): "The efforts towards the Modernize Chemical and Biological Research Laboratories DRDC Suffield (Modernize) project are continuing. The

**ANNEX A
to BCDRC 2021 Annual Report**

‘Identification’ and ‘Options Analysis’ phases to develop a Statement of Requirements (SOR) and cost estimation, respectively, are planned over a 24-month period via contract to an infrastructure consulting firm. Both phases will result in the selection of a course of action for the ‘Design’ phase. Thus far, the selected firm has held numerous discussions with DRDC Suffield Research Centre (SRC) and Assistant Deputy Minister (Infrastructure and Environment) (ADM(IE)) staff to gather pertinent information, leading to development of a draft Statement of Operational Requirements for which feedback has been provided. Additional meetings and discussions are scheduled between DRDC SRC and the Contractor over the coming weeks and months to further refine the document. Further, the Contractor is tasked with conducting a Business Case Options Analysis, wherein four options are presented. Finally, the Independent Review Panel for Defence Acquisition (IRPDA) provided advice on the ‘Modernize’ project at the IRP1 meeting; DRDC and ADM(IE) are now preparing for the IRP2 meeting. Overall, this project is progressing ahead of schedule given that the original deadline for SOR development was October 2022.”

Status: OPEN

- 2. (2016) *A comprehensive assessment of Suffield Research Centre’s unique occupational health and emergency medical support needs should be conducted under the leadership of DRDC in order to identify gaps and to design and implement long terms solutions involving relevant stakeholders. [This recommendation has been reworded to reflect the situation in 2019]***

DND/CAF Response (April 2017): “As the national authority responsible for the oversight and provision of direction related to the compliance, control, and risk management of CBRN S&T activities, the Chief of Staff (Science and Technology) will undertake an assessment of Suffield Research Centre’s occupational health and emergency support needs during Fiscal Year 17/18. The assessment will be designed to engage all relevant stakeholders in identifying any potential gaps and providing options to address them.”

BCDRC Comment (December 2017): We look forward to learning of the outcome of this assessment during our next visits to SRC and the DRDC Corporate Office.

DND/CAF Response (April 2018): “The Health and Safety Management System (HSMS) at Suffield Research Centre is comprised of an overarching Health and Safety manual with annexes for each safety area, including chemical and biological safety. The HSMS is reviewed on a bi-annual basis and is currently under review by relevant Section Heads and safety staff. In addition, the Suffield Research Centre has established a more comprehensive Integrated Emergency Response Plan, involving the Base Medical Centre and the CFB Suffield Fire Department. To reflect this, modifications to the current Service Level Agreements (SLA) are taking place. Further, the Suffield Research Centre has a scheduled audit of its entire safety system for later in 2018. Moving forward, there is an initiative to examine the feasibility of integrating the HSMS into the framework of our Environmental Management System. Over the last years, significant internal efforts have been made to establish a more integrated H&S Program, indicating that a comprehensive

ANNEX A to BCDRC 2021 Annual Report

review via an external organization may not be needed. However, once the current HSMS review and safety audit are complete, the Suffield Research Centre will re-evaluate the need to conduct any additional reviews.

BCDRC Comment (December 2018): As stated in our 2018 report, the occupational health and emergency medical support situation has improved substantially over the past year. Nevertheless, the Committee believes that a comprehensive assessment is still merited in order to stabilize and sustain appropriate occupational health and medical support programmes and systems for the future. It may be that the current Health and Safety Management System Review will achieve the same goal. As such, we will ask for a report on the Review's results during our 2019 visit to SRC, after which we will revisit this recommendation.

DND/CAF Response (February 2019)

"Notes from DRDC Suffield:

The Health and Safety Management System (HSMS) at Suffield Research Centre is comprised of an overarching Health and Safety manual with annexes for each safety area, including chemical and biological safety. The HSMS is reviewed on a bi-annual basis and is currently under review by relevant Section Heads and safety staff.

The Suffield Research Centre has established a more comprehensive Integrated Emergency Response Plan, involving the CFB Suffield Medical Centre, the CFB Suffield Fire Department, CFB Suffield Military Police, and Alberta Health Services. To reflect this, modifications to the current Service Level Agreements are taking place. Indeed, a comprehensive Integrated Emergency Response Exercise (IERE) organized by DRDC Suffield and conducted at CFB Suffield on September 5, 2018 demonstrated the cooperation by DRDC Suffield to bring relevant stakeholders together, including DRDC Suffield, CFB Suffield Fire Department, CFB Suffield Field Ambulance, CFB Suffield Military Police, Medics from the British Army Training Unit Suffield (BATUS), and Alberta Health Services, to successfully complete one of the most advanced emergency exercise cross the agency [*sic*]. Any news of the IERE was posted on the Government Canada website by ADM Public Affairs on September 7, 2018 (<https://www.canada.ca/en/department-national-defence/news/2018/09/successful-integrated-emergency-response-exercise-conducted-at-cfb-suffield.html>). Further, the Suffield Research Centre has an external audit of its entire safety system scheduled for Fall 2019. Moving forward, there is an initiative to examine the feasibility of integrating the HSMS into the framework of our Environmental Management System.

Over the last several years, significant internal efforts have been made to establish a more integrated H&S Program at the Suffield Research Centre which is consistent with ADM (S&T)'s Environment, Health and Safety Policy, indicating that a comprehensive review via an external audit organization may not be needed. However, once the current HSMS review and safety external audit are complete, the Suffield Research Centre will re-evaluate the need to conduct any additional reviews.

Notes from Canadian Forces Health Services:

ANNEX A

to BCDRC 2021 Annual Report

Not related to Canadian Forces Health Services. Canadian Forces Health Services would participate in a comprehensive review but are not the primary stakeholder.”

BCDRC Comment (December 2019): Notwithstanding that this recommendation *per se* has not been acted upon, we have noted, as recorded in last year’s report, several substantial and enduring improvements commendably effected locally by SRC, CFB Suffield and others with the support of regional and national level authorities. Foremost amongst these was the engagement of a Medical Advisor by SRC. Consequently, our major concerns have been alleviated – at least temporarily. We maintain, however, that the components of an occupational health programme and an emergency medical response capability that meet the needs of SRC (and which already exist in large measure) should be locally defined, integrated and incorporated in a tool such as the existing SRC Risk Management Framework and their status monitored. Moreover, where appropriate, these components should be cemented in place by officially promulgated policy or formal agreements between parties including non-DND or CAF parties. As soon as the first of these steps is completed, the Committee would be inclined to close the recommendation as having been superseded by other actions.

DND/CAF Response (April 2020): “The Health & Safety Management System (HSMS) Manual has been completed and is available to all Suffield Research Centre (SRC) staff. This is an overarching document describing the various elements of the SRC Health and Safety Program as well as their interdependencies; it was designed to meet the CAN/CSA OHSAS 18001:07 Standard (ISO 45001:2018 equivalent) for health and safety management best practice. Additionally, an external audit was performed in September 2019 on the Safety and Environmental Management System (SEMS) and went very smoothly; the report is currently in draft and SRC is awaiting its release to review and implement any recommended actions. Further, a job hazard analysis was initiated in September 2019, with the data collection completed by a scientist from the Defence Research and Development Canada Toronto Research Centre. The data are now with a contractor for analysis. The Integrated Emergency Response Plan (IERP) is also complete, including emergency response plans for a variety of incidents. CF Health Services will continue to support SRC’s occupational health and emergency medical support needs. DND/CAF considers this recommendation completed.”

BCDRC Comment (December 2020): While acknowledging these important actions, we continue to believe that the components of an occupational health program and an emergency medical response capability that meet the needs of SRC (and which already exist in large measure) should be locally defined, integrated, and incorporated in a tool such as the existing SRC Risk Management Framework and their status monitored with a view to quickly flagging to management the re-emergence of deficiencies. Moreover, where appropriate, these components should be cemented in place by officially promulgated policy or formal agreements between parties including non-DND or non-CAF parties to avoid slippage and dependence on specific personal relationships. As soon as the first of these steps is completed, the Committee would be inclined to close this recommendation as having been superseded by other actions.

ANNEX A
to BCDRC 2021 Annual Report

DND/CAF Response (April 2021): “The Health & Safety Management System (HSMS) Manual has been completed and is available to all Suffield Research Centre (SRC) staff. This is an overarching document describing the various elements of the SRC Health and Safety Program as well as their interdependencies; it was designed to meet the CAN/CSA OHSAS 18001:07 Standard (ISO 45001:2018 equivalent) for health and safety management best practice. Additionally, an external audit was performed in September 2019 on the Safety and Environmental Management System and went very smoothly; the report is currently in draft and SRC continues to wait for its release to review and implement any recommended actions. Further, a job hazard analysis was initiated in September 2019, with the data collection completed by a scientist from the DRDC Toronto Research Centre. The analysis of the collected data continues and a final report is expected. The Integrated Emergency Response Plan is also complete, including emergency response plans for a variety of incidents.

The SRC Risk Management Framework was discussed at some length during the virtual visit with BCDRC in September 2020, and the intent behind this portion of Recommendation 2 was clarified. This Framework is in the process of being updated based on this discussion; however, a completion date cannot be provided at this time for two reasons: 1) it relies on updating other tracking systems (e.g., a list of current SOPs and their revision history); and 2) a shortage of personnel.

With regards to emergency medical support, SRC continues to rely on the Base Medical Centre for emergency response to any chemical exposure and on our contracted Medical Advisor along with public health for other types of exposures and incidents. In Fall 2020, the Base Surgeon was posted out and the incoming Base Surgeon arrived. Due to COVID-19, neither of the usual CBRN courses (US and UK CBRN courses) were available to the incoming Base Surgeon. To mitigate this, DRDC SRC and the outgoing Base Surgeon designed and executed a 1-week CBRN Clinical Course which was also offered to other CAF medical staff. The course was well received and there are ongoing discussions to make it a regular offering.”

BCDRC Comment (December 2021): We continue to believe that the components of an occupational health program, and an emergency medical response capability, that meet the needs of SRC, should be locally defined and incorporated in a tool such as the existing SRC Risk Management Framework, and that their status should be monitored, with a view to quickly flagging to management the re-emergence of deficiencies. Moreover, where appropriate, these components should be cemented in place by officially promulgated policy or formal agreements between parties, including non-DND or non-CAF entities, to avoid slippage and dependence on specific personal relationships. As we stated in last year’s report, as soon as the first of these steps is completed, the Committee would be inclined to close the recommendation as having been superseded by other actions. We viewed the first draft of such a framework during our November visit, and we consider a good start. We will wait until it is finalized before committing to closing our recommendation.

ANNEX A
to BCDRC 2021 Annual Report

On a related note, we believe that this framework would lend itself to tracking the relevance and currency of the numerous health, safety, and environmental protection SOP in force at SRC.

DND/CAF Response (August 2022): “This recommendation is being addressed using a multifaceted approach:

1) The Health & Safety Management System (HSMS) Manual has been completed and was last revised in March 2020; it is available to all SRC staff on the DRDC intranet site. This is an overarching document (reviewed and updated bi-annually) describing the various elements of the SRC Health and Safety Program as well as their interdependencies; it was designed to meet the Canadian Standard Association Occupational Health and Safety Management Systems (CAN/CSA OHSAS) 18001:07 Standard (ISO 45001:2018 equivalent) for health and safety management best practice. Additionally, an external audit was performed in September 2019 on the Safety and Environmental Management System and went very smoothly; the report was received in January 2020. A copy of this report was provided to the Committee following its most recent in-person visit. While the audit did not specifically examine chemical and biological safety elements, it did highlight several related non-conformances, including the need to update the Integrated Emergency Response Plan (IERP). The Environmental Health and Safety (EHS) group has initiated corrective action and reviews progress quarterly; the last such review was completed in February 2022. The IERP is currently undergoing a major revision to improve the coordination with other emergency response documentation (e.g., Emergency Response Team Standard Operating Procedures).

2) A job hazard analysis was initiated in September 2019 and data collection was completed by a scientist from the DRDC Toronto Research Centre. Unfortunately, the data analysis was not conducted and the DRDC SRC EHS group has now adopted the analysis task. A Registered Industrial Hygienist (RIH) has been hired and will complete the assessments and analysis in the May-July 2022 timeframe.

3) In 2020, the Canadian Forces Fire Marshall indicated that SRC must develop and maintain its own CBRN respiratory protection plan. This plan is nearing completion and should be published by the end of May 2022.

4) The SRC Risk Management Framework has been updated and slightly modified to better reflect the health and safety (H&S) elements in place at SRC; this activity is ongoing. As indicated previously, a shortage of personnel to manage this task has been an impediment to its advancement.

5) There is now an approved process for creating and managing Standard Operating Procedures (SOPs) that includes appropriate oversight and archiving. This process will be implemented in spring 2022 with an expectation that all SRC SOPs, including those critical to our H&S Program, will gradually align.

6) With regards to emergency medical support, SRC continues to rely on the Base Medical Centre (BMC) for emergency response to any chemical exposure. For response to other types of exposures and incidents, SRC relies on our contracted Medical Advisor and public

ANNEX A
to BCDRC 2021 Annual Report

health. In fall 2020, DRDC SRC and the outgoing Base Surgeon designed and executed a 1-week CBRN Clinical Course which was well received. However, due to instructor availability challenges and the requirement for formal course development in accordance with Canadian Forces Individual Training & Education System (CFITES) course standards, the current position is to continue to obtain the training from the US and UK. Due to recent international chemical incidents and the specialized knowledge required for response, DRDC and Canadian Forces Health Services (CFHS) are attempting to establish a national medical team for reach-back purposes during chemical incidents. This will likely include updates to current doctrine and medical practice; this information will be shared among Canadian Armed Forces professional medical networks.

7) Finally, the DRDC SRC Medical Advisor has been comparing SRC SOPs against those at the BMC to identify gaps. He is also continuing to foster relationships at Medicine Hat Regional Hospital, with the intent of clarifying what support might be available from this facility.”

Status: OPEN

3. (2017) *Given the unique and essential capability of the Central Medical Equipment Depot, the operational importance of its gaining Good Manufacturing Practice accreditation; and, the potential value of collaboration with the Public Health Agency of Canada; consideration should be given to the replacement and relocation of this facility with a view to overcoming the shortfalls and impediments posed by its current state and location.*

DND/CAF Response (April 2018): “CF H Svcs Gp appreciates that BCDRC is emphasizing this in its report and fully agrees with this recommendation. The current condition, capacity and location of the CMED facility poses several risks to the ongoing management of our medical stockpile.

A Good Manufacturing Practices-compliant (GMP) facility and a Health Canada issued Establishment License are essential to ensuring the quality of the various medical products that the Group imports, stores, distributes and potentially shares with other government departments and allied partners. A licensed facility, with a robust quality assurance system in place should minimize the risk of operationally essential medical resources becoming compromised.

A strategic level partnership between CF H Svcs Gp and PHAC has recently been formalized between the Surgeon General and the VP of Health Security Infrastructure Branch at PHAC. Ongoing efforts will be applied to exploring short term solutions while scoping an ongoing collaborative partnership that would be focused on common infrastructure requirements and coordinated inventory management and procurement.

CMED replacement has been identified as a requirement and has been included in the DND infrastructure plan. However, given the current prioritization of the project, we anticipate that it will be at least ten years before the facilities are replaced and relocated. CF H Svcs must accept and manage these risks but our ability to mitigate them remains limited. Although our strengthened partnership with PHAC may introduce other risk mitigation opportunities, the limitations of the current CMED facility may prevent a full

ANNEX A
to BCDRC 2021 Annual Report

realization of the benefits of this partnership. The ideal solution to the problem would be an acceleration of the approval and funding of this project and early efforts are taking place to elevate its position on the departmental prioritization list.”

BCDRC Comment (December 2018): We are encouraged by the support voiced for this recommendation by CFHS Gp HQ and other NDHQ authorities. CMED replacement is now identified as a requirement and is included as priority 32 of 144 departmental infrastructure projects. Notwithstanding this placement, construction is many years off. In the meantime, we commend the Group’s intention to continue to strengthen its partnership with PHAC, and, in so doing, to look for opportunities to mitigate some of the risks associated with CMED’s current situation. We will closely monitor developments beginning with our next visit to CMED in 2019.

DND/CAF Response (February 2019)

“Notes from Canadian Forces Health Services:

Canadian Forces Health Services Group (CF H Svcs Gp) appreciates that BCDRC is emphasizing this in its report and fully agrees with this recommendation. The current condition, capacity, and location of the CMED facility poses several risks to the ongoing management of our medical stockpile. A Good Manufacturing Practices-compliant (GMP) facility and a Health Canada issued Establishment License are essential to ensuring the quality of the various medical products that the Group imports, stores, distributes and potentially shares with other Government departments and allied partners. A licensed facility, with a robust quality assurance system in place should minimise the risk of operationally essential medical resources being compromised.

A strategic level partnership between CF H Svcs Gp and PHAC has recently been formalized between the Surgeon General and the VP of Health Security Infrastructure Branch at PHAC. Ongoing efforts will be applied to exploring short term solutions while scope an ongoing collaborative partnership that would be focused on common infrastructure requirements and coordinated inventory management and procurement.

CMED replacement has been identified as a requirement and has been included in the DND infrastructure plan. However, given the current prioritization of the project, we anticipate that it will be at least ten years before the facilities are replaced and relocated. CF H Svcs Gp must accept and manage these risks but our ability to mitigate them remains limited. Although our strengthened partnership with PHAC may introduce other risk mitigation opportunities, the limitations of the current CMED facility prevent a full realization of the benefits of this partnership. The ideal solution to the problem would be an acceleration of the approval and funding of this project and early efforts are taking place to elevate its position on the departmental prioritization list.

In November 18, a briefing note was sent to ADM (IE) requesting approval to engage in a strategic infrastructure collaboration between DND and the Public Health Agency of Canada (PHAC) on a shared medical warehouse on CFB Trenton. This project continues to be 35th on the priority list for ADM (IE) and 3rd for Military Personnel Command’s

ANNEX A
to BCDRC 2021 Annual Report

infrastructure requirements. The importance of this project to CF H Svcs and the CAF will continue to be emphasized.”

BCDRC Comment (December 2019): Renovations to mitigate the shortfalls of the existing facility continue including a proposal to construct a GMP certifiable room to permit exchange of products with PHAC. We encourage expedient funding of this proposal.

DND/CAF Response (April 2020): “The replacement of the Central Medical Equipment Depot (CMED) continues to be a high priority for the CF Health Services. A number of joint activities between CF Health Services and the Public Health Agency of Canada have occurred in support of the new CMED facility. Site options in Trenton have been developed and are pending final review. Overall, good progress has occurred in the project to construct a new CMED facility.”

BCDRC Comment (December 2020) We remain strong in our support of the need to replace and relocate the CMED, but understand this may not occur for many years – the project being 35th on the relevant list of CAF infrastructure priorities. In the meantime, we are happy that renovations to bring the laboratory room up to GMP standards are underway. We commend the efforts of CFHS Group to address the risk to which this situation gives rise and hope that the current heightened public awareness of the importance of appropriate medical equipment and pharmaceutical supply and distribution facilities will be of benefit in this connection.

DND/CAF Response (April 2021): “Initial design requirements developed in 2018 delineated the need for the facility to be compliant with current Good Manufacturing Practices as described in GUI-0069 Health Canada Guideline. The project staff have been engaged in the identification of potential siting locations, and are currently working with DND Real Property Managers as to the footprint best suited to the facilities’ requirements. However, completion of the project depends on where it figures on the list of Departmental priorities and availability of funds. DND is maintaining engagement with the Public Health Agency of Canada (PHAC) about possible collaboration with the construction of this facility that could serve both organisations’ purposes. Of note, renovations are nearing completion on the CMED laboratory room with temperature mapping scheduled for February 2021 and again in summer 2021. It will be used as an interim approach while the capital project for a new facility continues to progress through the DND project process.”

BCDRC Comment (December 2021): We remain strong in our opinion that the location, condition, and capacity of the CMED merit its replacement and relocation noting that the direction of the Strategic Medical Countermeasures Program (SMCP) suggests that even more demands will soon be placed on this unit. This said, we were impressed by the interim measures that have been, or soon will be implemented at the Depot to address the most pressing concerns over condition and capacity.

DND/CAF Response (August 2022): “The Central Medical Equipment Depot (CMED) remains highly prioritized for a new building project on the Military Personnel Command list of priority projects, but with the current capital pressure on ADM(IE), the timeline for

ANNEX A
to BCDRC 2021 Annual Report

the CMED project is in the 10-year range. The Department of National Defence continues to pursue the building replacement project, and the Canadian Forces Health Services Directorate of Health Services Delivery has re-engaged with the Public Health Agency of Canada on the feasibility of interoperability for storage of critical medical counter-measures. CMED is also actively pursuing increasing its storage capacity in the current facility by re-occupying space currently used by other units.”

Status: OPEN

4. (2019) *Authoritative information on the management of incidents involving unique risk factors at Suffield should be provided to first responders such that they may effectively and safely operate during an emergency.*

DND/CAF Response (April 2020): “A Suffield Research Centre (SRC) document on safety advice and guidance for DND/CAF personnel and operators regarding nerve agents is being drafted for publication. The intent of this guide is to provide DND/CAF personnel with the most up-to-date knowledge of highly toxic nerve agents and special considerations for responding to and managing incidents where they may be involved. Once published, it could then be provided to emergency personnel and stakeholders responsible for incidence response at CFB Suffield should the need arise to inform decision making on hazard assessment and exposure routes; toxicity, symptoms and health monitoring; detection and identification; protection, contamination control; decontamination and casualty management; and medical treatment. The document is expected to be published in June 2020.”

BCDRC Comment (December 2020): We understand that due to the impact of the COVID 19 pandemic, publication of this document has been delayed. We look forward to notification of its release to relevant DND/CAF personnel.

DND/CAF Comment (April 2021): A SRC document on safety advice and guidance for DND/CAF personnel and operators regarding nerve agents will soon be published. The intent of this guide is to provide DND/CAF personnel with the most up-to-date knowledge of highly toxic nerve agents and special considerations for responding to and managing incidents where they may be involved. Once published, it could then be provided to emergency personnel and stakeholders responsible for incidence response at CFB Suffield should the need arise to inform decision making on hazard assessment and exposure routes; toxicity, symptoms and health monitoring; detection and identification; protection, contamination control; decontamination and casualty management; and medical treatment. The actions needed to close out this recommendation were delayed by the SRC response to COVID-19 but will be completed during fiscal year 2021-22.

BCDRC Comment (December 2021): An excellent reference document titled, “Responding to an incident involving organophosphorus nerve agents, Safety advisory and guidance” has been completed and approved for public release. It is an excellent paper, and we laud its DRDC authors for what we consider to be a valuable and timely contribution to public safety. We urge that it be widely distributed. Although we consider our recommendation closed, as having been implemented, we will continue to monitor

ANNEX A
to BCDRC 2021 Annual Report

its status. In view of this investment of scientific knowledge and experience, and the likely evolution of this family of agents and the guidelines for dealing with them, we also encourage DRDC to maintain the currency of this document and to communicate regularly to end-users its continued relevance, whether changes be made or not, in order to maintain confidence in its utility.

Status: CLOSE

5. (2019) DRDC senior leadership should take action to ensure that an appropriate succession plan is in place to address the turnover of personnel in critical positions at SRC.

DND/CAF Response (April 2020): “The DRDC Director General Science & Engineering has developed and implemented a multi-phase succession plan, which commenced in July 2019. All forecasted retirements at Suffield Research Centre have been reviewed and approved for replacement, with inclusion of a hand-over period for those positions with unique and critical knowledge and skillsets (e.g., Bio-Safety Officer).”

BCDRC Comment (December 2020) We credit DRDC for its effective initial response to this recommendation. This said, we are led to believe that there remains some turbulence around the replacement of the head of the Chemical Synthesis and Characteristics Group, which is a crucial, one-of-a-kind position. More generally speaking, we acknowledge that keeping the research and development sections at SRC fully staffed is a perpetual challenge given the specialized skills and knowledge required and the relative remoteness of the location. As such, section heads spoke of the value they attach to the increasing understanding and support of corporate human resources authorities. We also heard appreciation expressed for recent success in securing new corporate services positions or filling vacancies locally. We hope to see more evidence of such effective collaboration during our next visit at which point we may be prepared to close this recommendation as having been implemented.

DND/CAF Response (April 2021): “The ADM (DRDC), the Chief of Staff (DRDC), and DRDC Director General Science & Engineering continue to maintain a multi-phase succession plan. All forecasted retirements at Suffield Research Centre have been reviewed and approved for replacement, with inclusion of a hand-over period for those positions with unique and critical knowledge and skillsets (e.g. Safety Officers). While some positions have been filled, it remains difficult to hire people into positions that require extensive knowledge and/or expertise – likely due to the more remote location of SRC. There have also been delays in issuing Letters of Offer due to the lengthy process and time required to issue security clearances to new employees. Additionally, the high vacancy rate for Chemical Biological-related capabilities has caused the workload of those remaining to increase, thereby reducing the amount of staff available to perform hiring functions.”

BCDRC Comment (December 2021): It is fair to say that staffing of positions at SRC will always merit close attention. We believe, however, that the acute concerns that led to our 2019 recommendation have been addressed and that we can close this recommendation as having been implemented.

Status: CLOSE

ANNEX A
to BCDRC 2021 Annual Report

6. (2020) *The terms of reference, composition and operation of the Chemical Safety Committee at the Suffield Research Centre should be reviewed and, if necessary, modified to ensure that it effectively contributes to the maintenance of a safe workplace.*

DND/CAF Response (April 2021): “The Terms of Reference and membership have been formally updated and approved as of 21 October 2020. The changes to the membership included the addition of a toxicology advisor, a hazardous materials advisor, and a member external to the sections that undertake CWA research. The Terms of Reference were focused such that the Chemical Safety Committee can concentrate on matters referred by the General Safety and Health committee and on the review of Standard Operating Procedures and Online Turbo Application Proposals, a SRC tool that provides safety oversight to research and field trials. The meeting schedule was made more frequent in an effort to address some of the long-standing items on the Committee’s agenda.”

BCDRC Comment (December 2021): We commend the Chemical Safety Committee for refreshing its terms of reference and membership and making progress clearing its the agenda of past items. We were pleased to hear the current Chemical Safety Committee Chair report that the workload is manageable and that internal sub-committees comprising members from across the Centre possess sufficiently diverse expertise to be effective. We also commend the intent of the new Chemical Safety Officer, as pandemic public health measures allow, to take part in the routine activities of the laboratories in order to develop good relationships with staff, observe laboratory practices at first-hand, respond informally to concerns, and assess safety culture. This recommendation is now considered closed as having been implemented.

Status: CLOSE

ACRONYMS AND ABBREVIATIONS

AChE – acetylcholinesterase

ADM DRDC – Assistant Deputy Minister – Defence Research and Development Canada

ADM IE – Assistant Deputy Minister – Infrastructure and Environment

AWC – Agent Worker Certification

BATUS – British Army Training Unit Suffield

BCD – Biological and Chemical Defence

BCDRC – Biological and Chemical Defence Review Committee

BCW – Biological and Chemical Warfare

BTWC – Biological and Toxin Weapons Convention

BWTMCM – Biological Warfare Threat Medical Countermeasures

CAF – Canadian Armed Forces

CBM – Confidence Building Measures

CBRN – chemical, biological, radiological, and nuclear

CBRNE – chemical, biological, radiological, nuclear, and explosive

CFB – Canadian Forces Base

CFFCA – Canadian Forces Firefighting and CBRN Academy

CFHS Group – Canadian Forces Health Services Group

CFHS Group HQ – Canadian Forces Health Services Group Headquarters

COLPRO – Collective Protection

CMED – Central Medical Equipment Depot

CNSSSF – Canadian National Single Small-scale Facility

CTTC – Counter Terrorism Technology Centre

CWC – Chemical Weapons Convention

DAOD – Defence Administrative Order and Directive

DND – Department of National Defence

DRDC – Defence Research and Development Canada

DSSTP – Defence and Security Science & Technology Program

DURC – Dual Use Research of Concern

EPG – Experimental Proving Ground

ANNEX B
to BCDRC 2021 Annual Report

FY – fiscal year

GAC – Global Affairs Canada

GLP – Good Laboratory Practice

GMP – Good Manufacturing Practice

GSO – General Safety Officer

MBCF – Modular Biological Containment Facility

MCM – medical countermeasures

NATO – North Atlantic Treaty Organization

NDHQ – National Defence Headquarters

ONTAP – On-line Turbo Approval Process

OPCW – Organization for the Prohibition of Chemical Weapons

PPE – Personal Protective Equipment

PAO – Plan for Administrative Oversight

PHAC – Public Health Agency of Canada

PAO – Plan for Administrative Oversight

S&T – science and technology

SLA – Service Level Agreement

SOP – Standard Operating Procedure

SMCP – Strategic Medical Countermeasures Program

SRC – Suffield Research Centre

WTRP – Weapons Threat Reduction Program