

Confidence Building Measures

Canada

2011 Annual Report of
Confidence Building Measures
Biological and Toxin Weapons Convention



Government
of Canada

Gouvernement
du Canada

Canada

CONFIDENCE BUILDING MEASURE A (Part 1)

Exchange of Data on Research Centres and Laboratories - #1

1. Name(s) of the research centre and/or laboratory

National Microbiology Laboratory
Public Health Agency of Canada
Canadian Science Centre for Human and Animal Health

2. Responsible public or private organization or company

Public Health Agency of Canada

3. Location and postal address

Public Health Agency of Canada
1015 Arlington Avenue
Winnipeg, Manitoba
R3E 3R2

4. Source(s) of financing of the reported activity, including indication if the activity is wholly or partly financed by the Ministry of Defense

Canadian Government - Public Health Agency of Canada

5. Number of maximum containment units within the research centre and/or laboratory, with an indication of their respective size (m²)

Level 4 - 1 unit (185 m²)

6. If no maximum containment unit, indicate highest level of protection

N/A

7. Scope and general description of activities, including type(s) of micro-organisms and/or toxins as appropriate

This laboratory is a national centre of expertise that provides diagnostic, reference and research services on human diseases mainly from biosafety level 3 and 4 microorganisms.

Micro-organisms used and or stored in this facility : Bacteria and viruses known to impact human health.

Toxins: SEB, Clostridium botulinum, ricin

CONFIDENCE BUILDING MEASURE A (Part 1)

Exchange of Data on Research Centres and Laboratories - #2

1. Name(s) of the research centre and/or laboratory

National Centre for Foreign Animal Disease

2. Responsible public or private organization or company

Canadian Food Inspection Agency, Science Branch

3. Location and postal address

1015 Arlington Street
Winnipeg, Manitoba
R3E 3M4

4. Source(s) of financing of the reported activity, including indication if the activity is wholly or partly financed by the Ministry of Defence

Canadian Government - Canadian Food Inspection Agency

5. Number of maximum containment units within the research centre and/or laboratory, with an indication of their respective size (m²)

Level 4: 2 units (65m²) and (35m²)

6. If no maximum containment unit, indicate highest level of protection.

See above for highest level.

7. Scope and general description of activities, including type(s) of micro-organisms and/or toxins as appropriate.

The National Centre for Foreign Animal Disease within the Canadian Science Centre for Human and Animal Health conducts diagnostic testing and research on livestock and poultry diseases that are non-indigenous to Canada. The centre became operational in April 1998.

CONFIDENCE BUILDING MEASURE A (Part 2)

Form A: part 2 (i)

National Biological Defence Research and Development Program Declaration

1. Is there a national program to conduct biological defence research and development within the territory of the State Party, under its jurisdiction and control anywhere? Activities of such a program would include prophylaxis, studies on pathogenicity and virulence, diagnostic techniques, aerobiology, detection, treatment, toxicology, physical protection, decontamination and other related research.

For CANADA, YES

National Biological Defence Research and Development Program

Defence Research & Development Canada (DRDC):

II. Description

1. The objective of the Canadian Biological Defence Program at Defence R&D Canada is to ensure that the Canadian Forces are provided with an adequate defence against biological warfare agents. No offensive studies of any kind are permitted by the Government of Canada. The Program is wholly funded by the Canadian Department of National Defence and Public Safety Canada on behalf of the Government. The principal research and development areas are the following:
 - a. assessment of the hazards that may be faced by the Canadian Forces from biological agents and toxins;
 - b. detection of biological agents and toxins using immunological, biochemical and physical detection methods;
 - c. medical countermeasures against the infections or intoxications from biological agents and toxins;
 - d. decontamination of biological agents and toxins;
 - e. personal protection from biological agents and toxins;
 - f. studies on the mode of action and toxicity of toxins and the mode of action and infectivity of biological agents; and
 - g. provision of biological agent training for the Department of National Defence and the First Responder community.
2. In Canada, the biological and chemical defence programs are integrated; exact separation of the costs of the two programs would be very difficult without a detailed analysis of every purchase. It is estimated that in 2010/2011, the amount spent on the Canadian biological defence program was \$8,251,000 including salaries. The source of this funding was the Government of Canada.
3. Yes
4. See answer to question 2. About \$6,177,000 was spent on contracts with industry and universities.
5. Contractors are used to support all of the various aspects of the program listed in paragraph 1 above.
6. In Canada, the research and development program in biological defence is the responsibility of the Defence R&D Canada (DRDC). Research and some development are carried out primarily at the Defence R&D Canada – Suffield (DRDC Suffield) and through contractors. The bulk of the development program is carried out from DRDC Corporate headquarters. A minor effort in the stand-off detection of biological agents is carried out at DRDC Valcartier. Organizational chart of those parts of DRDC Suffield and DRDC Valcartier responsible for biological defence are included; only those organisational elements working on Biological Defence are included.

CBRNE Research and Technology Institute (CRTI):

1. The **Chemical, Biological, Radiological, Nuclear and Explosives (CBRNE) Research and Technology Initiative (CRTI)** is mandated to strengthen Canada's ability to prevent, prepare for, respond to and recover from CBRNE threats through investment in science and technology.
2. CRTI is an ongoing program with Government of Canada funding of \$175,000,000 until 2012. Funds are for the CBRNE projects and it is not possible to know exactly the percentage specifically allocated to biological research alone as many of the projects respond to more than one of the CBRNE hazards.
3. Yes, aspects of this programme are conducted under contract with industry, academic institutions, or in other non-defence facilities.
4. Funds distributed to industry, government and academia can be seen in the following chart:

CRTI \$ BY SECTOR	CRTI \$M SEVEN ROUNDS	%
Industry	\$98M	43%
Government	\$93M	41%
Academia	\$36M	16%
TOTAL	\$227M	100%

5. Summarize the objectives and research areas of the programme performed by contractors and in other facilities with the funds identified under paragraph 4:

Since 2002, The CRTI Program has conducted 8 Calls for Proposals through which it has implemented 152 research projects representing an investment of \$241M. The project partners have leveraged this investment by \$242M of in-kind contribution, a one-to-one ratio. The 152 projects are summarized in **Annex 1**.

6. Provide a diagram of the organizational structure of the programme and the reporting relationships (include individual facilities participating in the programme).

The participating departments and agencies are:

- Department of National Defence/Defence R&D Canada
- Department of Public Safety
- Health Canada
- Public Health Agency of Canada
- Environment Canada
- Agriculture and Agri-Food Canada
- Canadian Food Inspection Agency

- Department of Fisheries and Oceans
- National Research Council
- Natural Resources Canada
- Royal Canadian Mounted Police
- Canadian Security Intelligence Service
- Atomic Energy of Canada Ltd.
- Industry Canada
- Canada Border Services Agency
- Canadian Nuclear Safety Commission
- Transport Canada
- Public Works and Government Services Canada
- Privy Council Office, and
- Treasury Board Secretariat.

7. Provide a declaration in accordance with Form A, part 2 (iii) for each facility, both governmental and non-governmental, which has a substantial proportion of its resources devoted to the national biological defence research and development programme, within the territory of the reporting State, or under its jurisdiction or control anywhere.

All projects under the CRTI are carried out in existing facilities that are already covered in other sections of this report.

8. In 2010, the CRTI Program did not put forward a call for proposals so the current roster of projects remains as reported the previous year. Instead, the CRTI Program placed emphasis on supporting two major events occurring that year, the Vancouver 2010 Winter Olympics, and the G-20/ G-8 meetings in Toronto and Huntsville, Ontario. Included among the chemical and biological initiatives for these events was the acquisition and deployment of world class mobile laboratories, a chemical mobile laboratory to Defence R&D Canada Suffield, and a biological mobile laboratory to the Public Health Agency of Canada's laboratories in Winnipeg. Also, as part of this initiative, the RCMP acquired a mobile forensic laboratory based in Ottawa. These three new mobile laboratories, and other existing mobile laboratories, and their teams of scientists were deployed to two locations, the Seaforth Armoury in Vancouver and to Spruce Meadows in Whistler site to support the Olympics. The two locations became known as "Science Town". The three new mobile laboratories represent a \$10 million investment which is being sustained by the three organizations. In order to support the security effort for these major events, the Centre for Security Science launched a Major Events Coordinated Security Solutions initiative, which brought together science capability from across the federal community. It resulted in their coordinated deployment in support of the National CBRNE Response Team, which is led by the RCMP.

Annex 1: CRTI projects, 2002-2010

Charter #	Project Title	Project Portfolio	Lead Federal Department	Current CSS Investment	In-Kind Contribution
CRTI 01-0006RD	Induction of innate and specific immunity at muscosal surfaces	BIO	PHAC	\$ 1,199,135	\$ 1,264,500
CRTI 01-0011TA	Unified Interoperability Solution set to Support CONOPS Framework Development - Municipal-Provincial-Federal Collaboration to CBRN Response	BIO	DRDC Suffield	\$ 791,561	\$ 535,000
CRTI 01-0064RD	New technologies for surveillance of biowarfare agents and identification of engineered virulence genes	BIO	PHAC	\$ 2,423,221	\$ 1,487,402
CRTI 01-0087RD	Therapeutic antibody therapy for Ebola virus	BIO	PHAC	\$ 2,612,181	\$ 1,607,262
CRTI 01-0091RD	Development of monoclonal antibodies for treatment and detection of bio-terrorism agents	BIO	PHAC	\$ 2,556,575	\$ 3,562,640
CRTI 01-0154RD	Rapid DNA based diagnostic tests to identify five bacterial bio-threat agents	BIO	DRDC Suffield	\$ 2,594,393	\$ 1,751,702
CRTI 01-0196TA	Development of rapid detection field tests for Vet first responders to address agro-terrorism with animal pathogens	BIO	CFIA	\$ 4,824,099	\$ 4,700,000
CRTI 02-0021RD	Direct detection and identification of bioweapon nucleic acids based on cationic polymers	BIO	NRCC	\$ 1,000,001	\$ 1,090,801
CRTI 02-0035RD	Canadian Network for Public Health Intelligence (CNPHI)	BIO	PHAC	\$ 3,653,497	\$ 4,208,572
CRTI 02-0041TA	Deployable CBRN monitoring network	BIO	Health Canada	\$ 1,135,028	\$ 562,000
CRTI 02-0066RD	Risk analysis preparedness and management of bioterrorism of animal and zoonotic disease	BIO	CFIA	\$ 1,321,069	\$ 3,614,378

Charter #	Project Title	Project Portfolio	Lead Federal Department	Current CSS Investment	In-Kind Contribution
CRTI 02-0069RD	Molecular epidemiology of biothreat agents	BIO	PHAC	\$ 1,654,769	\$ 889,872
CRTI 02-0091TA	Clostridium botulinum genomic DNA microarray	BIO	Health Canada	\$ 391,723	\$ 617,131
CRTI 03-0005RD	Sensor Technology for the Rapid Detection and Identification of Pathogens used as Bioweapons	BIO	NRC	\$ 2,200,000	\$ 4,524,943
CRTI 03-0021TD	Assay development and production team (ADAPT) for the development, validation, production, and distribution of assays for the identification of bioterrorism	BIO	PHAC	\$ 2,000,000	\$ 1,799,242
CRTI 03-0060RD	Protective Markers for Anthrax Serodiagnosis	BIO	DRDC Suffield	\$ 982,073	\$ 754,677
CRTI 04-0004RD	Canadian Animal Health Surveillance Network	BIO	CFIA	\$ 3,715,775	\$ 3,793,200
CRTI 04-0045RD	Development of Collections, Reference DNA Databases and Detection Systems to Counter Bioterrorism Against Agriculture and Forestry	BIO	AAFC	\$ 2,000,000	\$ 1,439,000
CRTI 04-0052RD	On Site Composting for Bio-Containment and Safe Disposal of Infectious Animal Carcasses and Manure in the Event of a Bio-Terrorist Attack	BIO	CFIA	\$ 2,000,000	\$ 3,438,641
CRTI 05-0078RD	Development of live replicating viruses as vaccines and therapies for Viral Hemorrhagic fever viruses	BIO	PHAC	\$ 2,010,000	\$ 4,708,494
CRTI 05-0090TA	Adaptation of recently developed DNA microarrays to Nanochip microarray technology for detection of agro-terrorism agents	BIO	PHAC	\$ 875,000	\$ 642,000
CRTI 05-0106TA	Development of fieldable nucleic acid detection techniques for category 1 and 2 biological agents	BIO	PHAC	\$ 780,000	\$ 945,754
CRTI 06-0138RD	Development of Canadian diagnostic capability for Rift Valley fever virus (RVFV)	BIO	CFIA	\$ 1,759,545	\$ 1,863,980
CRTI 06-0187TD	Portable biological agent detection system	BIO	NRCC	\$ 2,500,000	\$ 4,244,928
CRTI 06-0218RD	Pre-clinical development of a nasal adenovirus-based vaccine against Ebola virus.	BIO	PHAC	\$ 652,979	\$ 566,617

Charter #	Project Title	Project Portfolio	Lead Federal Department	Current CSS Investment	In-Kind Contribution
CRTI 06-0301TD	Development of Nasal Spray Formulated Antiviral Drug against Avian Influenza Virus	BIO	DRDC Suffield	\$ 1,892,961	\$ 1,060,000
CRTI 07-0135RD	Building Resilience and Rural Health System Capability for Pre-disaster Planning and Preparedness	BIO	PHAC	\$ 1,930,500	\$ 1,431,041
CRTI 07-0109RD	Development and Application of Foresight and Future Visioning to Support Capability Based Planning for Animal Disease Emergency Management in Canada	BIO	CFIA	\$ 1,917,000	\$ 2,528,000
CRTI 07-0234RD	Mitigating dissemination of bioterrorism agents in Canadian food systems	BIO	AAFC	\$ 1,569,865	\$ 2,256,587
CRTI 07-0132TA	Portable Electronic Microarrays For Agro-bioterrorism: Detection and Typing of High Consequence Agents	BIO	CFIA	\$ 1,375,675	\$ 1,075,356
CRTI 08-0176RD	Enhancing Resilience Among High Risk Populations to Maximize Disaster Preparedness	BIO	PHAC	\$ 1,922,250	\$ 1,135,000
CRTI 08-0190RD	Data Fusion Solutions for Monitoring CBRNE Threats	BIO	NRC	\$ 2,072,310	\$ 3,659,663
CRTI 08-0203RD	Science and Technology Solutions to Mitigate Vulnerabilities in Canada's Food Supply	BIO	CFIA	\$ 2,500,000	\$ 1,341,335
CRTI 08-0112TA	Human monoclonal antibodies against ricin	BIO	DRDC Suffield	\$ 1,200,000	\$ 1,182,755
CRTI 08-0122TD	Validation of decontamination processes in the Agri-Food context	BIO	CFIA	\$ 1,060,000	\$ 874,482
CRTI 08-0181TD	Detection and Identification Assay Validation Program for Biothreat Agents	BIO	PHAC	\$ 3,171,300	\$ 1,711,932
Biology Total	36 Projects			\$ 68,244,484	\$ 72,868,887
CRTI 01-0004TA	Development of MEMS-based Biological Agent Sensing Technology	CHEM	DRDC Suffield	\$ 49,892	\$ 25,000
CRTI 01-0019TA	Real-Time Confirmatory Bio Detection and Identification	CHEM	DRDC Suffield	\$ 2,400,965	\$ 3,073,146

Charter #	Project Title	Project Portfolio	Lead Federal Department	Current CSS Investment	In-Kind Contribution
CRTI 01-0029RD	Protecting the First Responder Against CB Threats (Developing New Standards for Broad Spectrum...)	CHEM	RMC	\$ 2,952,604	\$ 2,846,170
CRTI 01-0060TA	Rapid Triage Management Workbench	CHEM	NRCC	\$ 1,167,679	\$ 1,145,626
CRTI 01-0100TA	CB Plus Chamber	CHEM	DRDC Ottawa	\$ 1,649,722	\$ 1,795,278
CRTI 01-0120RD	Development of Two Dimensional Molecular Imprinting Techniques (for use in Sensing and Screening Devices)	CHEM	NRCC	\$ 1,638,183	\$ 1,647,328
CRTI 01-0131TA	HI-6 Nerve Agent Antidote System (International Collaboration on the Licensing of HI-6)	CHEM	DRDC Ottawa	\$ 4,531,099	\$ 15,000,000
CRTI 01-0161TA	CBRN Blast Protective Helmet	CHEM	RCMP	\$ 1,160,000	\$ 631,080
CRTI 02-0007TA	Medical countermeasures against ricin	CHEM	DRDC Suffield	\$ 1,607,376	\$ 1,086,600
CRTI 02-0043TA	Accelerated Consequences Management	CHEM	DRDC Suffield	\$ 1,962,121	\$ 1,839,704
CRTI 02-0053TA	Simulation based decision aid for the optimization of detection protection and decontamination systems with team structure and procedures	CHEM	DRDC Ottawa	\$ 1,312,481	\$ 1,157,889
CRTI 02-0067RD	Restoration of Facilities and Areas After a CBRN Attack	CHEM	EC	\$ 1,973,032	\$ 1,943,359
CRTI 02-0080RD	Psychological Risk Assessment and Management (9RAM) Tools to Enhance Response to CBRN Attacks and Threats in Canada	CHEM	PHAC	\$ 2,314,729	\$ 1,866,320
CRTI 02-0093TA	Advanced Polymer Research for Application to Personnel Protective Clothing	CHEM	DRDC Ottawa	\$ 1,026,911	\$ 597,000
CRTI 03-0009RD	Caring About Healthcare Workers at First Responders: Enhancing Capacity for Gender-Based Support Mechanisms in Emergency Preparedness Planning	CHEM	HC	\$ 1,089,817	\$ 1,095,839
CRTI 03-0013TD	Early CBRN Attack Detection by Computerized Record Surveillance (ECADS)	CHEM	NRCC	\$ 1,764,799	\$ 900,000
CRTI 03-0019TD	Real-time Bio-surveillance and response readiness	CHEM	PHAC	\$ 1,798,592	\$ 2,898,000
CRTI 03-0023TD	Portable and Collapsible Chem/Bio Isolators	CHEM	CSIS	\$ 514,260	\$ 581,543

Charter #	Project Title	Project Portfolio	Lead Federal Department	Current CSS Investment	In-Kind Contribution
CRTI 04-0018RD	Development of standards for chemical and biological decontamination of buildings and structures affected by terrorism	CHEM	EC	\$ 2,710,000	\$ 2,822,224
CRTI 04-0019TD	Field Demonstration of Advanced CBRN Decontamination Technologies	CHEM	EC	\$ 811,165	\$ 1,223,604
CRTI 04-0022RD	Rapid Separation and Identification of CBW Agents and Consumer Matrices using FAIMS Technology	CHEM	NRCC	\$ 448,499	\$ 750,118
CRTI 04-0082TA	RF and ECM Compatible CB-Blast Protective Helmet	CHEM	RCMP	\$ 400,000	\$ 391,522
CRTI 05-0016RD	Development of Canadian Standard for Protection of First Responders from CBRN events	CHEM	PWGSC	\$ 549,978	\$ 1,072,014
CRTI 05-0069RD	Development of PEGylated Granulocyte-Macrophage Colony Stimulating Factor for Acute Radiation Syndrome	CHEM	HC	\$ 1,370,852	\$ 1,279,986
CRTI 05-0092TA	Integrated Personal Cooling for Chemical-Biological Protective Undergarments	CHEM	RCMP	\$ 260,000	\$ 185,628
CRTI 06-0169TA	Universal Surface Decontamination Formulation	CHEM	EC	\$ 1,666,428	\$ 1,292,316
CRTI 06-0170RD	Organophosphorus agent decontamination	CHEM	EC	\$ 1,946,043	\$ 1,629,769
CRTI 06-0192TD	CBRN respiratory fit-testing program development	CHEM	RMCC	\$ 1,022,505	\$ 592,707
CRTI 06-0234TA	Advanced Syndromic Surveillance and Emergency Triage (ASSET)	CHEM	NRCC	\$ 2,000,000	\$ 1,251,717
CRTI 06-0255TA	Medical and Casualty Management Command Post and Temporary Treatment Center (MedPost)	CHEM	DRDC Ottawa	\$ 2,085,018	\$ 1,419,479
CRTI 06-0259TD	Psychosocial Risk Manager (PRiMer): Computer-based Pre-Event Training	CHEM	PHAC	\$ 1,968,790	\$ 2,522,500
CRTI 06-0283RD	Addressing deficiencies in All-Hazard Respiratory Protection for First Responders	CHEM	RMCC	\$ -	\$ -
CRTI 06-0299TA	Polymer Nanocomposite Barrier Fabric for First Responder Protection and Containment Operations	CHEM	DRDC Suffield	\$ 581,700	\$ 294,706

Charter #	Project Title	Project Portfolio	Lead Federal Department	Current CSS Investment	In-Kind Contribution
CRTI 07-0150TD	Casualty Care Continuum (from event scene to emergency department)	CHEM	HC	\$ 1,893,000	\$ 1,086,129
CRTI 08-0180TD	Establish an integrated National CBRNE Training System for Health, Psychosocial and Communication Responders	CHEM	PHAC	\$ 2,260,000	\$ 1,307,000
CRTI 08-0233TD	An HI-6 based intravenous product for nerve-agent post-treatment	CHEM	DRDC Suffield	\$ 1,660,000	\$ 1,216,984
CRTI 08-0234TD	Modelling the Effects of Public/Animal Health Emergencies on Laboratories	CHEM	PHAC	\$ 444,000	\$ 795,722
Chemistry Total	37 Projects			\$ 54,992,242	\$ 61,264,007
CRTI 04-0030TD	Nuclear Forensics Response Capabilities and Interoperability	Forensic	DRDC Ottawa	\$ 283,160	\$ 407,600
CRTI 04-0047TD	Chemical, Biological, Radiological and Nuclear Incident Database	Forensic	RCMP	\$ 1,662,749	\$ 1,251,145
CRTI 04-0112TD	Container Intrusive Sampling System	Forensic	RCMP	\$ 137,805	\$ 214,500
CRTI 05-0053TA	Deployable RN Incident Area Network: Wireless Mesh Topology	Forensic	Health Canada	\$ -	\$ -
CRTI 05-0058TD	Unified Interoperability Solution set to Support CONOPS Framework Development - Municipal-Provincial-Federal Collaboration to CBRN Response	Forensic	DRDC Ottawa	\$ 1,500,000	\$ 2,042,616
CRTI 05-0121RD	Evidence-Based Risk Assessment of Improvised CB weapons	Forensic	CSIS	\$ 658,939	\$ 768,796
CRTI 05-0122TD	CBRN Crime Scene Modeler (C2SM)	Forensic	RCMP	\$ 1,601,328	\$ 858,639
CRTI 05-0123TD	All-Hazards Sample Receiving Storage	Forensic	DRDC Suffield	\$ 2,300,400	\$ 1,752,162
CRTI 06-0202TD	Short-Range BioSpectra: A Device for the Surveillance of Bioaerosol in Large Indoor, Semi-Enclosed and Outdoor Spaces	Forensic	DRDC Valcartier	\$ 1,187,524	\$ 747,109
CRTI 06-0275TD	Integrated Two-Way Radio Radiation Sensors	Forensic	RCMP	\$ 2,248,463	\$ 1,327,014

Charter #	Project Title	Project Portfolio	Lead Federal Department	Current CSS Investment	In-Kind Contribution
CRTI 06-0317TD	PROBE –Crime Scene Support Tool for Police, Hazmat & EMS	Forensic	RCMP	\$ 3,469,390	\$ 1,734,695
CRTI 06-0318TD	Higher Education Cooperative for Hazardous Materials and Equipment Tracking (HECHMET)	Forensic	RCMP	\$ 3,873,704	\$ 2,202,890
CRTI 06-0319TD	Guidelines for Combined Air Demand and Heat Strain Management of First Responders	Forensic	DRDC Toronto	\$ 1,631,790	\$ 1,102,224
CRTI 07-0148TD	Decontamination and Mitigation Techniques for C,B and E Agents and the Effect on Forensic Evidence	Forensic	DRDC Suffield	\$ 1,141,200	\$ 764,804
CRTI 07-0216TA	Fast CBRNE Crime Scene Modeler (fC2SM)	Forensic	RCMP	\$ 2,095,660	\$ 1,199,482
CRTI 07-0193RD	A Compton Gamma Imager for Criminal and National Security Investigation	Forensic	NRC	\$ 1,425,258	\$ 1,536,880
CRTI 07-0219RD	Microbial Forensics Project	Forensic	PHAC	\$ 2,740,000	\$ 1,523,376
CRTI 08-0105RD	The Development of a Canadian CBRNE Recommended Equipment List	Forensic	CPRC	\$ 800,000	\$ 755,984
CRTI 08-0116RD	Forensic Attribution of CBRNE Materials: A Chemical Fingerprint Database	Forensic	PSC	\$ 1,500,000	\$ 861,000
CRTI 08-0192TD	Emergency Resource Inventory Network (ERIN)	Forensic	PSC	\$ 1,850,000	\$ 959,131
CRTI 08-0197TD	Capability Based Planning Validation Project / CBRN-E Rapid Assessment Team	Forensic	PSC	\$ 400,000	\$ 205,800
CRTI 08-0226TD	Capability Based Planning Validation Project / CBRN Mass Decontamination	Forensic	PSC	\$ 400,000	\$ 204,840
Forensic Total	22 Projects			\$ 32,907,371	\$ 22,420,687
CRTI 01-0027RD	Biological Dosimetry and Markers of Nuclear and Radiological Exposures	Radiological and Nuclear	Health Canada	\$ 3,600,574	\$ 4,948,389
CRTI 01-0052-TA	Rapid Carbon-14 analysis accelerator mass spectrometry	Radiological and Nuclear	Health Canada	\$ 683,670	\$ 722,971
CRTI 01-0072RD	Nanodosimeters Based on Optically stimulated luminescence	Radiological and Nuclear	DRDC Ottawa	\$ 973,052	\$ 1,849,900

Charter #	Project Title	Project Portfolio	Lead	Current CSS Investment	In-Kind Contribution
			Federal Department		
CRTI 01-0080TA	Information management and decision support system for RN (ARGOS suite)	Radiological and Nuclear	Health Canada	\$ 492,363	\$ 2,842,000
CRTI 01-0085TA	Evaluation of GM-CSF for acute radiation syndrome	Radiological and Nuclear	Health Canada	\$ 856,385	\$ 1,273,400
CRTI 01-0105TA	Mobile real-time national	Radiological and Nuclear	Health Canada	\$ 1,757,881	\$ 1,829,009
CRTI 01-0133RD	New technologies for the rapid assessment of radioactive contamination	Radiological and Nuclear	Health Canada	\$ 1,451,483	\$ 1,528,000
CRTI 01-0203RD	Standoff detection of radiation	Radiological and Nuclear	DRDC Ottawa	\$ 1,348,111	\$ 2,096,900
CRTI 01-0204RD	Buble Detector Film	Radiological and Nuclear	DRDC Ottawa	\$ 494,008	\$ 971,700
CRTI 02-0024RD	Probabilistic Risk Assessment for Radiological Dispersal Devices	Radiological and Nuclear	DRDC Ottawa	\$ 1,458,827	\$ 773,700
CRTI 02-0041RD	Real-time determination of area of influence of CBRN releases	Radiological and Nuclear	Health Canada	\$ 1,998,418	\$ 4,192,000
CRTI 02-0045RD	Forensic OSL (Optically Stimulated Luminescence)	Radiological and Nuclear	DRDC Ottawa	\$ 1,360,141	\$ 781,500
CRTI 02-0057TA	Canadian Radiation Alert/Expert System for Critical Infrastructure Monitoring	Radiological and Nuclear	Health Canada	\$ 634,319	\$ 1,038,780
CRTI 02-0093RD	Advanced emergency response system for CBRN Hazard prediction and assessment in urban environment	Radiological and Nuclear	EC	\$ 3,784,746	\$ 3,792,524
CRTI 03-0017TA	Development of a directional gamma ray probe	Radiological and Nuclear	DRDC Ottawa	\$ 438,850	\$ 227,135
CRTI 03-0018RD	Experimental Characterization of Risk for Radiological Dispersion Devices (RDDs)	Radiological and Nuclear	DRDC Ottawa	\$ 2,705,816	\$ 2,729,800
CRTI 03-0018TD	Airport Radiological Counter Terrorism Sensor Network	Radiological and Nuclear	Health Canada	\$ 1,849,561	\$ 2,098,000
CRTI 03-0025TA	Defender Nuclear Detection Web	Radiological and Nuclear	Health Canada	\$ 1,639,626	\$ 1,003,100
CRTI 04-0029RD	Development of an Electronic Neutron Dosimeter	Radiological and Nuclear	DRDC Ottawa	\$ 957,000	\$ 528,000
CRTI 04-0127TD	Canadian Health Integrated Response Platform	Radiological and Nuclear	HC	\$ 1,823,913	\$ 2,853,206
CRTI 05-0006TA	OSL Radiation Sensor for "Long-Dwell Detection in Transit (LDDT)" Applications	Radiological and Nuclear	DRDC Ottawa	\$ 686,600	\$ 371,000

Charter #	Project Title	Project Portfolio	Lead Federal Department	Current CSS Investment	In-Kind Contribution
CRTI 05-0014RD	Experimental and Theoretical Development of a Resuspension Database to Assist Decision Makers during RDD Events	Radiological and Nuclear	DRDC Ottawa	\$ 506,096	\$ 1,956,884
CRTI 05-0043RD	Economic Impact of Radiological Terrorism Events	Radiological and Nuclear	DRDC Ottawa	\$ 213,157	\$ 383,000
CRTI 05-0108TD	National Nuclear Emergency Laboratory Network and Interoperability	Radiological and Nuclear	Health Canada	\$ 984,544	\$ 1,017,925
CRTI 06-0146RD	Rapid Identification of Radiologically-Exposed Individuals for Medical Casualty Management	Radiological and Nuclear	Health Canada	\$ 1,905,002	\$ 1,963,709
CRTI 06-0156RD	Radiological Dispersal Device (RDD) Contamination Interactions with Urban Surfaces	Radiological and Nuclear	DRDC Ottawa	\$ 1,893,660	\$ 1,716,197
CRTI 06-0163TD	Real-Time Collaboration Enhancement for the ARGOS RN Risk Assessment System	Radiological and Nuclear	Health Canada	\$ 248,206	\$ 376,574
CRTI 06-0186RD	Novel DNA-based radiological dosimetry technology	Radiological and Nuclear	NRCC	\$ 2,191,830	\$ 2,988,902
CRTI 06-0188TA	Portable OSL System for Forensics and Retrospective Dosimetry	Radiological and Nuclear	DRDC Ottawa	\$ 914,055	\$ 652,883
CRTI 06-0230RD	Rapid Methods for Emergency Radiobioassay	Radiological and Nuclear	Health Canada	\$ 956,000	\$ 1,000,000
CRTI 07-0196TD	Towards an Operational Urban Modeling System for CBRN Emergency Response and Preparedness	Radiological and Nuclear	EC	\$ 2,042,700	\$ 1,118,721
CRTI 07-0103RD	Full-Scale RDD Experiments and Models	Radiological and Nuclear	DRDC Ottawa	\$ 3,982,690	\$ 4,808,031
CRTI 07-0190TA	Extension of Electronic Neutron Dosimeter (END) to Detect Gamma Rays (END2)	Radiological and Nuclear	DND	\$ 395,922	\$ 303,497
CRTI 07-0113TD	Swipeless Field Alpha Spectrometry Analysis	Radiological and Nuclear	HC	\$ 1,102,500	\$ 929,900
CRTI 07-0104TD	Multi-spectral Imaging System for the Detection of Radiological Contamination	Radiological and Nuclear	DRDC Ottawa	\$ 2,062,656	\$ 1,457,749
CRTI 07-0186RD	Optimization of MEDical DECORportion (MEDECOR) for time of use and improved bioeffects	Radiological and Nuclear	DRDC Ottawa	\$ 1,090,151	\$ 895,999
CRTI 08-0214RD	Special Nuclear Material Detection Via Computed Muon Radiography	Radiological and Nuclear	DRDC Ottawa	\$ 2,553,000	\$ 3,246,810

Charter #	Project Title	Project Portfolio	Lead Federal Department	Current CSS Investment	In-Kind Contribution
CRTI 08-0222RD	Stand-Off Radiation Detection by Air Radiolysis (SORDAR)	Radiological and Nuclear	DRDC Ottawa	\$ 1,257,000	\$ 1,052,838
CRTI 08-0208TA	Special Nuclear Materials and Radiological Detection, Locating and Tracking	Radiological and Nuclear	HC	\$ 2,000,000	\$ 968,778
CRTI 08-0173TD	Nuclear Forensic Lab Interoperability and Criminal Investigation	Radiological and Nuclear	HC	\$ 1,400,000	\$ 1,163,000
CRTI 08-0225TD	RN Response Criteria	Radiological and Nuclear	HC	\$ 500,000	\$ 393,225
CRTI 08-0241TD	Field Techniques for Emergency Radiobioassay	Radiological and Nuclear	HC	\$ 950,000	\$ 704,000
Radiological and Nuclear Total	42 Projects			\$ 60,144,512	\$ 67,549,636
CRTI 06-0150TD	Integrated blast risk assessment for improved preparedness and response	Explosives	PWGSC	\$ 1,573,000	\$ 1,070,000
CRTI 06-0159TA	Advanced Technical CBRNE Training Program for Explosives Cluster Members	Explosives	RCMP	\$ 1,000,000	\$ 1,420,000
CRTI 06-0171TA	Explosives Storage Magazine Large Opening Door Design	Explosives	NRC	\$ 172,800	\$ 130,916
CRTI 06-0204RD	Improvised Explosive Assessment Tool	Explosives	DRDC – S	\$ 3,250,000	\$ 2,665,646
CRTI 06-0236TA	CID-E Explosives Incident Expansion Project	Explosives	RCMP	\$ 1,390,218	\$ 865,903
CRTI 06-0252RD	Protocols for Modeling Explosive Threats in Urban Environments	Explosives	PSC	\$ 1,663,000	\$ 1,057,767
CRTI 07-0179RD	Explosives Vapors Stand-off Detector - Multi-option Differential Detection and Imaging Fourier Spectrometer (MoDDIFS)	Explosives	CSIS	\$ 2,071,440	\$ 1,340,554
CRTI 07-0121RD	Lightweight composite armour for IED protection: A single walled nanotube (SWNT) solution	Explosives	NRCC	\$ 1,840,282	\$ 2,699,532
CRTI 07-0176TD	National Standard for Design and Assessment of Buildings Against Blasts	Explosives	PWGSC	\$ 900,000	\$ 558,000
CRTI 07-0123TA	Blast Dosimetry and CBRNE Sensors Integrated into EOD PPE	Explosives	RCMP	\$ 1,350,000	\$ 1,189,748
CRTI 07-0153RD	Consolidated Assessment of Threats for the Transport of Combustible Liquid/Gaseous Fuels (FAE)	Explosives	DRDC – S	\$ 1,658,133	\$ 1,257,037

Charter #	Project Title	Project Portfolio	Lead Federal Department	Current CSS Investment	In-Kind Contribution
CRTI 08-0142RD	Immersive haptic tele-robotic system for improvised explosive device disposal	Explosives	DRDC – S	\$ 2,387,400	\$ 1,446,594
CRTI 08-0200RD	Defeat of IEDs Using Electron Pulse Generators	Explosives	DRDC Ottawa	\$ 840,000	\$ 627,267
CRTI 08-0104TA	Non-invasive sampling and analysis of explosives in air and sea cargo containers	Explosives	CBSA	\$ 785,000	\$ 695,000
CRTI 08-0131TD	Commercial Explosive Identification Tool (XIT)	Explosives	PSC	\$ 1,471,346	\$ 770,179
Explosives Total	15 Projects				\$ 17,794,143
Grand Total	152 Projects				\$241,897,359

National Biological Defence Research and Development Program

III. Facilities

Defence Research & Development Canada (DRDC):

1. Defence R&D Canada – Suffield (DRDC Suffield)

- a. The facility is located in Buildings 1, 10, 60, 600, 610 and the Colin Watson Aerosol Layout (CWAL) and associated minor structures, all co-located with Canadian Forces Base Suffield near the village of Ralston, Alberta, Canada. The postal address is

Director General
DRDC Suffield
Box 4000 Station Main
Medicine Hat, Alberta T1A 8K6
CANADA

- b. Floor area of laboratory areas in Building 1 by containment level:

BSL2 - 492 m²
BSL3 - 159 m²
BSL4 - 0 m²

The total laboratory floor area in Building 1 used for biological defence work is 868 m². An Aerosol Test Facility containing 38 m² of lab space is located next to Building 1; another aerosol test facility containing 33 m² of lab space is located at the CWAL. Building 10 is a vivarium and includes general laboratory space. The area of the vivarium is 1134 m². Building 610 occupies 76 m² of space. Field facilities for biological agent training exist in the vicinity of Building 60.

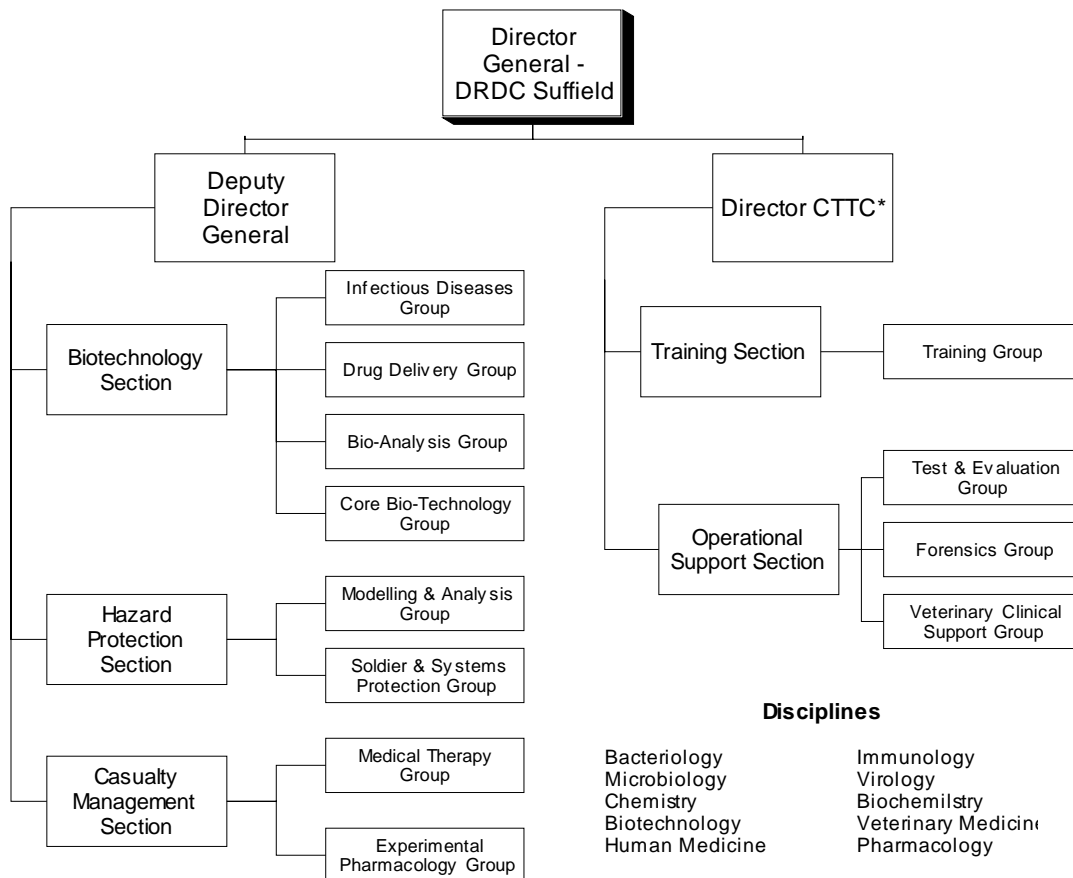
- c. The organizational structure of the facility¹ is:

- i. total number of personnel 24.0
- ii. division of personnel
- | | |
|----------|------|
| military | 0.6 |
| civilian | 23.4 |
- iii. division of personnel by category
- | | |
|------------|------|
| scientists | 10.1 |
|------------|------|

¹ The chemical and biological defence programs at this facility are fully integrated. The data presented herein is therefore a best estimate as to the portion that is affected to biological defence.

managers/admin support 1.9
 technologists 11.4

Organization Chart Canadian Research Program in Biological Defence



* - CTTC: Counter Terrorism Technology Center Elements not part of the biodefence program not show

iv. There is one contractor staff working in biological defence at this facility, working to develop medical countermeasures to, and detection of BW agents and toxins. A list of contractors carrying out R&D in biological defence is attached.

v. The research in this facility is 100% funded by the Departments of National Defence and Public Safety Canada and under contract to, or through collaborative agreements, with other government departments and industry.

Funding level estimates (including salaries): \$8,251,000

vi. All staff are encouraged to publish the results of their research in the open literature whenever not precluded by security or intellectual property considerations. There is also an internal publication system which is used for publications regardless of content. See attached list of publications (Form C).

- d. The biological defence program at DRDC Suffield is outlined in Form A, part 2, (ii), paragraph 1 and additional details follow. Assessment of the hazards from biological agents and toxins involves research to understand the dispersion of such agents and is carried out by mathematical modelling techniques. Part of the work in detection involves R&D leading to the production of field portable chemical/biological agent detection systems. In medical countermeasures, research is carried out on new drugs and vaccines and delivery systems, for example microencapsulated antibiotics and vaccines. Microorganisms other than Newcastle disease virus (NDV) and *Bacillus subtilis* var. *niger* (formerly *Bacillus globigii* (BG)) which have been used in the biological defence program are *Bacillus anthracis*, *Brucella* species (*abortus*, *melitensis*, *neotomae*, *ovis* and *suis*), *Burkholderia* species (*mallei*, *pseudomallei*) *Francisella tularensis*, *Mycobacterium tuberculosis*, *Yersinia enterocolitica*, *Yersinia pestis*, various influenza virus strains, Western Equine encephalitis, Eastern Equine Encephalitis, Venezuelan Equine Encephalitis and Chikungunya. Toxins used include botulinum toxin, staphylococcal enterotoxin B, ricin and various venoms from marine organisms, reptiles and insects. In the early to mid 1980s, outdoor studies have involved only NDV middle through 1980's and BG.

2. Defence R&D Canada – Valcartier

- a. The facility is located in building 25 and an aerosol chamber for Lidar measurements is located at about 300 m from building 25 (also on the main laboratory area complex). The postal address is

Director General
DRDC Valcartier
2459 Boul. Pie XI Nord
Québec, Québec, G3J 1X5
CANADA

- b. Floor area of laboratory areas in Building 25 by containment level:

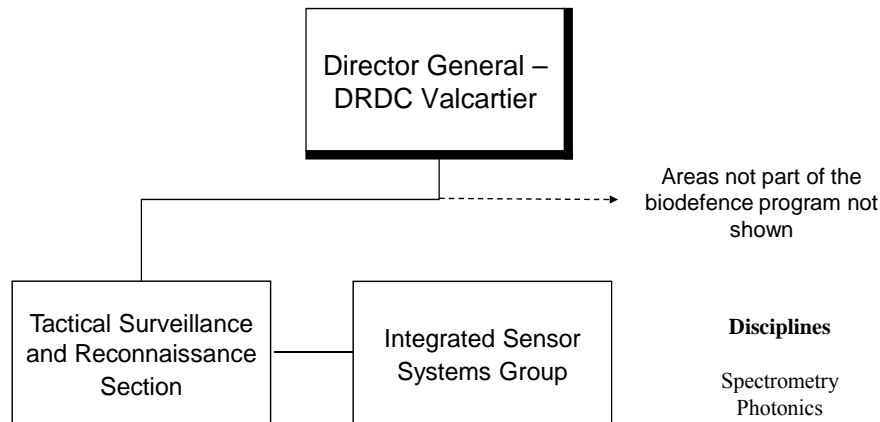
BSL1 - 72 m²

The aerosol chamber (2m x 2m x 22m) located outside of building 25 is used to characterize standoff biodetection systems under development with fluorescing aerosols simulating bioaerosols.

- c. The organizational structure of the personnel contributing to this activity is:
- i. total number of personnel 3
 - ii. division of personnel
civilian 3
 - iii. division of personnel by category

scientists	2
managers	0
technicians	1
admin. and support staff	0

Organization Chart
Canadian Research Program in Biological Defence



- iv. There are one contractor staff and one postdoctoral fellow working in biological defence at this facility. The contractor is working in management support to the standoff biodetection program and the postdoctoral fellow is a microbiologist who, in collaboration with the laboratory in aerology of hospital Laval, investigates standoff biodetection concepts. A list of contractors carrying out R&D in biological defence is attached.
- v. The research in this facility is 100% funded by the Departments of National Defence and Public Safety Canada and under contract to, or through collaborative agreements, with other government departments and industry.
- vi. Funding level estimates (including salaries): \$1,987,000
- vii. All staff are encouraged to publish the results of their research in the open literature whenever not precluded by security or intellectual property considerations. There is also an internal publication system which is used for publications regardless of content. See attached list of publications.
- d. The biological defence program at DRDC Valcartier, part of the one outlined in Form A, part 2, (ii), paragraph 1, targets essentially the detection of biological agents and toxins using photonic detection methods. This involves R&D leading to the production of field portable biological agent detection systems.

List of Contractors
Carrying Out Research and Development in Biological Defence
for the Department of National Defence of Canada - 2010

Contractor	Title
391035 Alberta Ltd, Lethbridge, AB	Assessment of the Health and Welfare of Swine
Advanced Integrated Microsystems Ltd, Vancouver, BC	Micro-Based Sample Processing for Bioanalysis and Mass Spectrometry
Canada Food Inspection Agency, Lethbridge, AB	Construction of pseudotyped baculovirus expressing the envelope protein of western equine encephalitis virus
Canada West Biosciences Inc, Calgary, AB	Development of Protein Suspension Array Technology for Characterization of Immune Responses and Identification of Biothreat (BT) Agents Detection and Identification of Microbes Using Microarray to Support Continuing Development of Microarray Investigating the Mechanisms of Neurotoxin Toxicity and Screening for Inhibitors Against Neurotoxins in Cultured Rat Cortical Neurons Screening of Mimetic Peptide Inhibitors of Neurotoxins and Fragment Fingerprint Analysis of Neurotoxins by Capillary Electrophoresis
China Agricultural University, Beijing, China	Efficacy Testing of Novel Gene-Based Antiviral Drugs Against Avian Influenza H5N1 Virus
Dr Robert Fisher, Medicine Hat, AB	Services to the DRDC Animal Care Committee for 2010/2011
Equal Air, Division of Quality Properties, Medicine Hat, AB	2010 DRDC Suffield Annual Central Laboratory BSL3 Inspection and Performance Testing
GenePharma Technologies, Sydney, NSW, Australia	Mitigation and Therapy of Biological Agents-Induced Inflammation and Apoptosis Using Gene Therapeutics
Jonathan Horsman, Medicine Hat, AB	Technical Services for GLP Study Initiation
Laval Hospital, Sainte-Foy, QC	Development of Infectious Viral Aerosol Transport and Detection Models Using Simulants with Emphasis on Field Sampling and Detection Microbiology laboratory services for the preparation of simulants of biological agents to be tested at Valcartier BSL1 laboratory).
Ms Ruth Bruins, Medicine Hat AB	Services to the DRDC Animal Care Committee for 2010/2011
National Institute of Health, Muang Nonthabuir, Thailand	Preparation and Submission of Clinical Protocols and Investigator's Brochure for the Clinical Trials of Liposome-Encapsulated and Free Poly ICLC for Clinical Development in Thailand
Pacific Rim Consulting Inc, Mt Hood, Oregon, USA	Quality Assurance Services for Good Laboratory Practice Facilities and Studies at DRDC Suffield
Sarah Cassidy, Edmonton, AB	Expansion of the Canadian Microbial Cell Collection Software
Thomas Jefferson University, Philadelphia, Pennsylvania,	Rational Design of Therapies for Medical and Casualty Management of Botulinum Toxin Poisoning

Contractor	Title
USA	
UGM Engineering, Toronto, ON	Development of Data Analysis Tools, Acquisition Processes and Validation Routines for Good Laboratory Practice Systems and Provision of GLP Engineering Support
University of British Columbia, Vancouver, BC	Microarray Analysis Following Nucleic Acid-Based Drug Treatment
University of Alberta, Edmonton, AB	Production and Purification of Monoclonal Antibodies to Biothreat Agents for Incorporation in Suspension Arrays Production of Recombinant Congugate Vaccine Candidates against Burkholders pseudonallei Production and Purification of Monoclonal Antibodies to Biothreat Agents for Incorporation in Suspension Arrays
University of Calgary, Calgary AB	Histological Evaluation of a Murine Wound Model for Mesenchymal Stem Cell Tissue Regeneration
University of Guelph, Guelph, ON	Supply of Neutralization Antibodies Against Botulinum Neurotoxins
University of Ottawa, Ottawa, ON	Immunological Support for Biothreat Agent Detection Using Novel Antibodies
University of Saskatchewan, Saskatoon, SK	Construction and characterization of a bovine adenovirus vectored vaccine against equine encephalitis virus
Vancouver Prostate Centre, Vancouver, BC	Microarray analysis following nucleic acid-based drug treatment
WebGenii Consulting, Redcliff, AB	Development of Data and Methods for Toxicologic, Genomic and Proteomic Data

CBRNE Research and Technology Institute (CRTI):

All projects under the CRTI are carried out in existing facilities that are covered in other sections of this report. As the CRTI is an interdepartmental initiative, all biological research is conducted in facilities for which Agri-Food and Agriculture Canada, the Department of National Defence, Health Canada, the Public Health Agency of Canada, National Research Council or the Canadian Food Inspection Agency are responsible.

CONFIDENCE BUILDING MEASURE B (I)

Exchange of Information on Outbreaks of Infectious Diseases - #1

Background information of nationally notifiable diseases: Human Health

Disease	2001	2002	2003	2004	2005	2006	2007	2008	2009
Acute Flaccid Paralysis ***	54	44	40	38	52	0	0	0	N.A.
AIDS	418	404	381	315	380	329	309	312	224
Amoebiasis**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N.A.
Anthrax****	N/A	0	0	0	0	1	0	0	N.A.
Botulism	8	10	6	7	1	14	13	11	N.A.
Brucellosis	9	8	7	8	11	5	10	12	N.A.
Campylobacteriosis	1188 6	1154 3	1002 5	9581	9949	9981	9611	9458	N.A.
Chancroid**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chickenpox*****	1975 -	1757 -	N.A.	1711	1750	1041	972	1138	N.A.
Chlamydial Infection	5005 6	5624 2	5998 8	6407 5	6650 3	6929 1	7440 6	77169	N.A.
Cholera	5	6	5	3	8	3	4	4	N.A.
Creutzfeld-Jakob Disease (CJD)***	23	32	27	32	44	44	38	47	50*
Cryptosporidiosis ***	1764	589	650	596	608	789	865	802	N.A.
Cyclospora ***	72	85	79	142	208	157	174	151	N.A.
Diphtheria	0	1	1	1	0	0	4	2	N.A.
Giardiasis	4850	4626	4228	4211	4264	4144	4235	4230	N.A.
Gonococcal Infections	6755	7354	8244	9276	9202	1131 3	1188 6	11824	N.A.
Gonococcal Ophtalmia Neonatorum**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Group B Streptococcal Disease in Neonates ***	98	106	100	64	67	70	59	74	N.A.
<i>Haemophilis influenzae</i> type b	36	32	34	38	30	32	27	45	N.A.
Hantavirus Pulmonary Syndrome ***	3	6	2	5	8	4	5	3	N.A.

Hepatitis A	436	424	395	464	361	478	299	298	N.A.
Hepatitis B	599	584	589	863	1452	1557	1509	2011	N.A.
Hepatitis C	1684 9	1596 1	1478 5	1457 8	1301 7	1201 7	1213 3	11915	N.A.
Hepatitis Non-A, Non-B**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Human Immunodeficiency Virus ***	2226	2491	2493	2542	2494	2547	2459	2636	2417
Invasive Group A Streptococcal Disease ***	830	864	1039	853	1025	1194	1427	1472	N.A.
Influenza, Laboratory	4204	6771	3517	1143	1287	7422	8133	12256	23376
Invasive Pneumococcal	1734	2271	2721	2914	2857	2883	3273	3194	N.A.
Legionellosis	48	56	46	42	114	121	122	166	N.A.
Leprosy	9	4	7	7	7	2	2	2	N.A.
Listeriosis**	N/A	N/A	N/A	N/A	86	103	128	212	N.A.
Malaria	445	366	376	374	365	333	385	372	N.A.
Measles	36	9	15	9	8	13	102	61	N.A.
Meningitis, Pneumococcal**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Meningitis, Other Bacterial**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Meningitis, Viral**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Meningococcal Infections (Invasive Meningococcal Disease)	368	212	173	188	155	189	205	176	N.A.
Mumps	102	202	28	33	79	42	1120	748	N.A.
Paratyphoid**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pertussis	2946	3223	3239	3111	2493	2346	1498	1967	N.A.
Plague	0	0	0	0	0	0	0	0	N.A.
Poliomyelitis	0	0	0	0	0	0	0	0	N.A.
Rabies	0	0	1	0	1	0	1	0	N.A.
Rubella	27	15	14	10	319	9	8	5	N.A.

Congenital Rubella	1	2	1	3	1	0	0	0	N.A.
Salmonellosis	6072	5991	5072	5104	6007	5478	6180	6069	N.A.
Shigellosis	945	1355	906	720	1014	647	833	752	N.A.
Smallpox****	N/A	0	0	0	0	0	0	0	N.A.
Syphilis, Congenital	3	6	6	2	11	8	7	7	N.A.
Syphilis, Infectious*****	N.A.	N.A.	N.A.	N.A.	357	369	407	450	N.A.
Syphilis, Early Latent	127	155	258	312	230	336	332	241	N.A.
Syphilis, Early	159	300	607	795	510	636	508	577	N.A.
Syphilis, Other (Includes all other types except congenital, early latent & early symptomatic)	408	524	632	666	1220	2187	1676	1747	N.A.
Tetanus	8	1	1	3	4	2	6	1	N.A.
Trichinosis**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N.A.
Tuberculosis	1773	1666	1631	1613	1641	1654	1578	1604	N.A.
Tularemia****	N/A	1	9	12	22	11	13	6	N.A.
Typhoid	105	101	113	112	108	147	143	175	N.A.
Verotoxigenic <i>E. coli</i> Infection	1334	1243	1083	1102	801	1079	1073	760	N.A.
Viral Hemorrhagic	N/A	0	0	0	0	0	0	2	N.A.
West Nile virus*****	N/A	N/A	1495	26	238	152	2401	38	N.A.
Yellow Fever	0	0	0	0	0	0	0	1	N.A.

AIDS, HIV, CJD, Tuberculosis and West Nile data is from the program area.

Influenza data is from the program area and is reported by season, August to August.

2000 data is case by case while the others are aggregate.

* Data is preliminary

** No longer a national notifiable disease.

*** New national notifiable disease starting January 2000.

**** New national notifiable disease starting November 2002.

***** New national notifiable disease starting January 2003.

***** Numbers from BC, MB, QC and SK not available

***** Only ON reports Infectious Syphilis (early symptomatic and early latent combined together)

N.A.= Not Available,

N/A = Not Applicable

Source: Division of Surveillance and Risk Assessment, Centre for Communicable Disease and Infectious Control, Public Health Agency of Canada.

Background information of nationally notifiable diseases: Animal Health

DEFINITION: Reportable diseases

These diseases are listed in the Health of Animals Act and Regulations and are usually of significant importance to human or animal health or to the Canadian economy

The list of "reportable" diseases includes all of the previously called OIE List A diseases. Reportable diseases are transmissible diseases which have the potential for very serious and rapid spread, irrespective of national borders, which are of serious socio-economic or public health consequence and which are of major importance in the international trade of animals and animal products.

DEFINITION: Notifiable diseases

In Canada, there is a second list of diseases called "notifiable" which also need to be reported to the veterinary administration (CFIA) on an immediate or annual basis. In general, immediately notifiable diseases are diseases exotic to Canada for which there are no control or eradication programs. Notifiable diseases are the transmissible diseases which are considered to be of socio-economic and/or public health importance within countries and which are significant in the international trade of animals and animal products.

The reports to OIE are posted on the new World Animal Health Information Database (WAHID) Interface website: <http://www.oie.int/wahid-prod/public.php?page=home>. Any additional written reports to the OIE will also be posted directly on the CFIA website.

CONFIDENCE BUILDING MEASURE B (II)

Information on outbreaks of infectious diseases and similar occurrences, that seem to deviate from the normal pattern

Nil

CONFIDENCE BUILDING MEASURE C

Encouragement of Publication of Results and Promotion of Use of Knowledge

Publications:

Note: Publication and knowledge sharing is strongly encouraged and a cornerstone of the CRTI.

I. Canadian Food Inspection Agency: National Centre for Foreign Animal Diseases:

1. Embury Hyatt, C. Pathology and viral antigen distribution following experimental infection of sheep and goats with capripoxvirus. *American Journal of Pathology*.
2. Weingartl, H. Effects of Nipah infection on porcine T cell populations in vitro and in vivo. *Journal of Virology*.
3. Pasick, J. Phylogenetic analysis of classical swine fever isolates from Peru. *Transboundary and Emerging Infectious Diseases*.
4. Tierney, K. Working with Rift Valley Fever Virus. C.A.L.A.S. 2010 Seminar.
5. Babiuk, S. An elastase-dependent attenuated swine influenza virus can protect against a H1N1 2009 influenza challenge in swine. *Journal of Virology*.
6. Luo, L. Analysis of Expression and Glycosylation of Avian Metapneumovirus Attachment Glycoprotein from Recombinant Baculoviruses. *Virus Research*.
7. Pasick, J. Pandemic H1N1 virus from naturally infected turkeys and comparison with turkeys experimentally infected with a human pH1N1 isolate. *Avian Diseases*.
8. Weingartl, H. Paramyxoviruses: Rubulavirus, menangle and nipah virus infections. *Disease of Swine Blackwell Publishing*.
9. Kloeze, H. Effective Animal Health Disease Surveillance Using a network-Enabled Approach. *Transboundary and Emerging Infectious Diseases*.
10. Babiuk, S. CIHR Pandemic meeting 2010.
11. Babiuk, S. Detection of Lumpy Skin disease virus antigen and DNA in Formalin fixed paraffin embedded tissues (FFPET) from a natural outbreak in Egypt 2006. *Egyptian Journal*.
12. Weingartl, H. Development of Early Diagnostic Capability for Rift Valley Fever Virus in Livestock in North America. *Journal of Clinical Microbiology*.
13. Pasick, J. Molecular and antigenic characterization of triple reassortant H3N2 swine influenza viruses isolated from pigs, turkey and quail in Canada. *Transboundary and Emerging Diseases*

14. Alexandersen, S. Foot-and-mouth disease viral loads in pigs in the early, acute stages of disease. *Vet Rec.* **166**:10-14, 2010.
15. Alexandersen, S. Molecular cloning and phylogenetic analysis of integrins $\alpha\beta 1$ and $\alpha\beta 6$ of one-humped camel (*Camelus dromedarius*). *Vet. Immunol. and Immunopath.* **135**:164-171, 2010.
16. Weingartl, H.M. Genetic and Pathobiologic Characterization of Pandemic H1N1 2009 Influenza Viruses from a Naturally Infected Swine Herd. *J. J. Virol.* **84**:2245-2256, 2010.
17. Alexandersen, S. Patterns, risk factors and characteristics of reported and perceived foot-and-mouth disease (FMD) in Uganda. *Tropical Animal Health and Production* **42**:1547-1559, 2010
18. Alexandersen, S. Antibodies against foot-and-mouth disease (FMD) virus in African buffalos (*Syncerus caffer*) in selected national parks in Uganda (2001-2003). *Transboundary and Emerging Diseases* **57**:286-292, 2010.
19. Alexandersen, S. Prevalence of antibodies against foot-and-mouth disease virus in cattle in Kasese and Bushenyi districts in Uganda. *International Journal of Animal and Veterinary Advances.* **2**:89-96, 2010.
20. Alexandersen, S. Options for decentralized testing of suspected secondary outbreaks of foot-and-mouth disease. *Transbound. Emerg. Dis.* **57**:237-243, 2010.
21. Alexandersen, S. Serotype Specificity of Antibodies against Foot-and-Mouth Disease Virus in Cattle in Selected Districts in Uganda. *Transbound. Emerg. Dis.* **57**:365-374, 2010.
22. Alexandersen S. Effective Animal Health Disease Surveillance Using a Network-Enabled Approach. *Transbound. Emerg. Dis.* **57**:414-419, 2010.
23. Alexandersen, S. The role of African buffalos (*Syncerus caffer*) in the maintenance of foot-and-mouth disease in Uganda. *BMC Veterinary Research*, **6**:54 (1-13), 2010.
24. Berhane, Y. Molecular characterization of pandemic H1N1 influenza viruses isolated from turkeys and pathogenicity of a human pH1N1 isolate in turkeys. *J. Avian Diseases*, **14**:1275-1285, 2010.

II. Public Health Agency of Canada:

1. Pillet S, Kobasa D, Meunier I, Gray M, Laddy D, Weiner DB, von Messling V, Kobinger GP. Cellular immune response in the presence of protective antibody levels correlates

- with protection against 1918 influenza in ferrets. *Vaccine*. 2011 Jan 4.
2. Ao Z, Wang X, Bello AJ, Danappa Jayappa K, Yu Z, Fowke K, He X, Chen X, Li J, Kobinger GP, Yao X. Characterization of anti-HIV activity mediated by R88-Apobec3G mutant fusion proteins in CD4+ T cells, PBMCs and macrophages. *Hum Gene Ther*. 2010 Dec 23.
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IV. Defence Research & Development Canada – INTERNAL PUBLICATIONS:

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2. Fulton, R.E. and Thompson, H.G., Quantitative Analysis of Ricin in Sample Unknowns by Immunological Assay, DRDC Suffield TM 2010-080, Unclassified.
3. Yee, E., Lien, F.S., and Ji, H., A Building-Resolved Wind Field Library for Vancouver. Facilitating CBRN Emergency Response for the 2010 Winter Olympics, DRDC Suffield TM 2010-088, Unclassified.
4. Stratilo, C., Allele Exchange Vectors for *Burkholderia Pseudomallei*, DRDC Suffield TM 2010-116, Unclassified.
5. Ford, B., Bader, D., Ruttan, C., and Mah, D., Isothermal Amplification of Genomic Samples for Detection/Identification, DRDC Suffield TM 2010-143, Unclassified.
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7. Dai, X., McLaws, L., Schnell, G., Viswanathan, S., Bhogal, H., and Wong, J.P., Flow Cytometric Quantification of Lung Natural Killer Cell Activity Associated with TLR-3 Signaling Pathway Activation, DRDC Suffield TM 2010-188, Unclassified.
8. Bader, D.E. and Fisher, G.R., Molecular Genetic Analysis of Killed Biological Agents in Sample Unknowns - NATO SIBCRA Exercise IX, DRDC Suffield TM 2010-189, Unclassified.
9. Hayward, S.L., Radford, C.L., and Fulton, R.E., ECL Immunoassay for Detection and Identification of *Francisella tularensis*, DRDC Suffield TM 2010-196, Unclassified.
10. Ford, B.N. and Bader, D.E., Microarray systems for microbial detection and identification, DRDC Suffield TR 2010-203, Unclassified
11. Chan, N.W.C., Tang, T., Lee, W.E., Gebremedhin, M.G., and Mah, D.C.W., Liquid Chromatography - Mass Spectrometry Analysis of Botulinum Neurotoxin Serotype A Light Chain Assay Mixtures, DRDC Suffield TM 2010-219, Unclassified.
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ORAL PRESENTATIONS

Name of Speaker: Soren Alexandersen

Name of Presentation: "FADs; Everything a Bovine Practitioner Need to Know & Speculation on Bovine FADs for Western Canada

Date: January 16, 2010

Name of Speaker: Soren Alexandersen

Name of Presentation: What the Next Pandemic may Bring - The Global Picture of H1N1 and Zoonotic Disease Outbreaks

Date: January 19-22, 2010

Name of Speaker: Soren Alexandersen

Name of Presentation: Canadian perspective on impact of FAD's

Date: January 26, 2010

Name of Speaker: James Neufeld

Name of Presentation: Descriptive Pathology Terminology and morphological Diagnosis

Date: January 27, 2010

Name of Speaker: Soren Alexandersen

Name of Presentation: Vesicular Diseases

Date: January 27, 2010

Name of Speaker: Carissa Embury-Hyatt

Name of presentation: Rinderpest, Peste des petits ruminants and the Global Rinderpest eradication program

Date: January 29, 2010

Name of Speaker: Basic Immunology for Foreign Animal Disease

Name of Presentation: Kathleen Hooper McGrevy

Date: January 30, 2010

Name of Speaker: Kathleen Hooper McGrevy

Name of Presentation: Test result Interpretation and Diagnostic Principles

Date: January 30, 2010.

Name of Speaker: Chris Kranendonk
Name of Presentation: Sample Collection and Submission
Date: January 30, 2010

Name of Speaker: John Pasick
Name of Presentation: Classical Swine fever/African swine fever
Date: January 30, 2010

Name of Speaker: John Pasick
Name of Presentation: Pseudorabies
Date: January 30, 2010

Name of Speaker: Jose Lopez
Name of Presentation: Contagious bovine and caprine pleuropneumonia
Date: January 31, 2010

Name of Speaker: Jose Lopez
Name of Presentation: Glanders
Date: January 31, 2010

Name of Speaker: Contagious equine metritis
Name of Presentation: Jose Lopez
Date: January 31, 2010

Name of Speaker: Shawn Babiuk
Name of the Presentation: Poxvirus
Date: February 1, 2010

Name of Speaker: Soren Alexandersen
Name of Presentation: Current regulations and future needs: what will be the future regulatory standards
Date: February 1-3, 2010

Name of Speaker: African Horse Sickness
Name of Presentation: James Neufeld
Date: February 2, 2010

Name of Speaker: John Copps
Name of the Presentation: Agrobioterrorism
Date: February 2, 2010

Name of Speaker: Soren Alexandersen
Name of Presentation: FAD Course held at NCFAD in January/February 2010
Date: February 22-23, 2010

Name of Speaker: Soren Alexandersen
Name of Presentation: FOOT-AND-MOUTH DISEASE - LESSONS LEARNED FROM RECENT EUROPEAN EPISODES
Date: May 14, 2010

Name of Speaker: Soren Alexandersen

Name of Presentation: Update on annual progress and lessons learned in regard to the pandemic H1N1

Date: June 6-9, 2010

Name of Speaker: Soren Alexandersen

Name of Presentation: FOOT-AND-MOUTH DISEASE - LESSONS LEARNED FROM RECENT EUROPEAN EPISODES

Date: June 10, 2010

Name of Speaker: Soren Alexandersen

Name of Presentation: CAHSN

Date: June 13-16, 2010

Name of Speaker: Soren Alexandersen

Name of Presentation: the NAFMDVB: "Situation Update with focus on vaccine use in Japan

Date: July 11-14, 2010

Name of Speaker: Soren Alexandersen

Name of Presentation: Agroterrorism Risk Reduction: Foot-and-Mouth Disease (FMD) as a model

Date: September 8-10, 2010

Name of Speaker: Soren Alexandersen

Name of Presentation: What can be done to keep a high level of preparedness to FMD in free countries?

Date: September 27 to October 2, 2010

Name of Speaker: Soren Alexandersen

Name of Presentation: harmonization of pH1N1 diagnostics

Date: October 12-14, 2010

Name of Speaker: Soren Alexandersen

Name of Presentation: Potential Threats to Canadian Swine by Emerging and Exotic RNA and Single-Stranded DNA Viruses

Date: October 14-16, 2010

Name of Speaker: John Pasick

Name of Presentation: Molecular and antigenic characterization of H1N1 swine influenza viruses from Canadian pigs in 2009-2010

Date: November 16-17, 2010

CONFIDENCE BUILDING MEASURE D

Active Promotion of Contacts:

1. Planned international conferences, symposia, seminars, and other similar for a for exchange
 1. **Name of conference:** Directors of High Security Bio-Containment Facilities GOHLD Meeting
Arranging organization: CFIA National Centre for Foreign Animal Disease
Time: September 2011
Place: Winnipeg, MB
Main subject(s) for the conferences: International and National High Containment issues
Conditions for participation: Invited participant
Point of contact for further info, registration, etc.: Dr. Soren Alexandersen & Dr. John Copps
 2. **Name of conference:** Foreign Animal Disease Course
Arranging organization: CFIA National Centre for Foreign Animal Disease
Time: January 2012
Place: Winnipeg, MB
Main subject(s) for the conferences: Foreign Animal Disease Veterinary Diagnosis
Conditions for participation: Member of CFIA or invited guest
Point of contact for further info, registration, etc.: Dr. Chris Kranendonk
 3. **Name of conference:** EDPLN annual meeting
Arranging organization: World Health Organization (Canada is co-chair)
Time: Usually December
Place: Usually Geneva
Main subject(s) for the conferences: Emerging and dangerous pathogens laboratory networks (global and regional).
Conditions for participation: Member of an EDPLN network
Point of contact for further info, registration, etc.: Dr. Renu Dayal-Drager (dayaldragerr@who.int)
 4. **Name of conference:** GOARN exercise
Arranging organization: GOARN (Canada is coordinator)
Time: Tentatively Fall 2011
Place: Tentatively Rome
Main subject(s) for the conferences: Detection, identification and diagnostic of hemorrhagic fever viruses (main focus)
Conditions for participation: GOARN member
Point of contact for further info, registration, etc.: Dr. Theodore Kuschak (Theodore Kuschak/HC-SC/GC/CA)
 5. **Name of conference:** Viral Hemorrhagic Fever (VHF) meeting
Arranging organization: Different organizations, next may be UTMB (University of Texas)

Time: To be announced

Place: To be announced

Main subject(s) for the conferences: Viral Hemorrhagic Fever viruses usually with an emphasis on Filoviruses

Conditions for participation: Working on VHF

Point of contact for further info, registration, etc.: Not determined yet.

6. **Name of conference:** Public Security S&T Summer Symposium 2011 - Common Problems: Shared Solutions. Enhanced Public Security through Collaborative S&T.

Arranging organization: CBRNE Research and Technology Initiative (CRTI)

Time: June 13-16, 2011

Place: National Capital Region

Main subject(s) for the conferences: The Summer Symposium focuses on the scientific and technical progress of CRTI within the past year. All CRTI projects managers are invited to present orally or by poster presentation. There is additional space in the programme for a limited number of oral presentations from scientific organizations on topics of CBRNE prevention, preparedness and response as well as topics of interest to all-hazards preparedness. The theme selected for this year's symposium will enable focused sessions on the Threat, Targets and Operations to mitigate any perceived threat.

Conditions for participation: CRTI participants or allied scientific organizations engaged in similar research and technology programs.

Point of contact for further info, registration, etc.: DRDC Centre for Security Science

7. **Name of conference:** International High Containment Biosafety Workshop

Arranging organization: Public Health Agency of Canada (PHAC) and International Centre for Infectious Diseases (ICID)

Time: May 15-20, 2011

Place: Winnipeg, MB

Main subject(s) for the conferences: This rigorous five-day course allows participants to work hands-on in the special containment and facility support areas (BSL 3 and 4) of the Canadian Science Centre for Human and Animal Health, one of the world's most recognized containment laboratory complexes. Workshop topics include for example: Design and operation of containment laboratories, Methodology and application of risk assessments, Personal protective equipment use and assessment, Principles and practices of containment laboratory entry/exit, Assessment and performance verification of primary and secondary containment devices, Monitoring and testing for decontamination; practices and procedures, Response to emergencies and biological spills, Implementation of high impact training programs, Safety and quality management systems in the laboratory, and Lessons learned in facility design and construction

Conditions for participation: Space is limited and participants are determined through a critical review of applications.

Point of contact for further info, registration, etc.: biorisk@icid.com

8. **Name of conference:** Canadian Biosafety Symposium

Arranging organization: Public Health Agency of Canada (PHAC), Canadian Food Inspection Agency (CFIA), and International Centre for Infectious Diseases

(ICID)

Time: June 6-10, 2011

Place: Toronto, ON

Main subject(s) for the conferences: Biosafety focus - agenda not yet decided but will be posted at: <http://biosafety.icid.com/en/>. The Canadian Biosafety Symposium will feature presentations and posters on an array of biosafety topics, including containment facilities design, maintenance and equipment; laboratory management and operations; animal containment; biosecurity; and, infectious diseases affecting human and animals. It will be a unique opportunity for the biosafety community to learn and share knowledge with colleagues from across Canada and other countries.

Conditions for participation: Attendance via registration - abstract submissions are evaluated as are speaking requests

Point of contact for further info, registration, etc.: info@icid.com

2. Information regarding other opportunities

There is occasional meetings involving mainly the North American BSL-4 community (with UK) in the U.S. We have been participating as these meeting propose guidelines and new requirements regarding different aspects of BSL-4 operations including research avenues, research tools, animal models, biosafety and biosecurity.

Dr. Gary Kobinger, Chief Special Pathogens is trying to visit 1-2 foreign BSL-4 facilities to promote collaboration and sharing of information. In 2010 meetings in Italy and South Africa offered the opportunity to visit the new BSL-4 in Rome and the one in Johannesburg.

CONFIDENCE BUILDING MEASURE E

Declaration of Legislation, Regulations and Other Measures

<u>Relation to</u>	<u>Legislation</u>	<u>Regulations</u>	<u>Other Measures</u>	<u>Amended since Last Year</u>
a) Development, production stockpiling, acquisition or retention of microbial or other biological agents, or toxins, weapons, equipment and means of delivery specified in Article I.	YES	YES	YES	NO
b) Exports of microorganisms* and toxins.	YES	YES	YES	NO
c) Imports of microorganisms* and toxins.	YES	YES	YES	NO

* Microorganisms pathogenic to man, animals and plants in accordance with the Convention.

For more information, please consult the Canadian report entitled Biosafety, Biosecurity, and Biological Non-Proliferation Legislation, found on the website of Foreign Affairs and International Trade Canada, at http://www.international.gc.ca/arms-armes/non_nuclear-non_nucleaire/bio_legislation-bio_lois.aspx, and of the website of the Implementation Support Unit, [here](#).

CONFIDENCE BUILDING MEASURE F

Declaration of Past Activities in Offensive and/or Defensive Biological Research and Development Programs

1. Date of Entry into Force - 26 March 1975 (Deposit 18 September 1972)

2. Past offensive biological R&D programs:

a. Yes

b. 1 Jan 46 to 30 Jun 58

c. In the above period offensive work undertaken by Canada included: studies of improved procedures for production of certain toxins (eg. botulinum and diphtheria); studies on the use of insects as vectors for pathogenic bacteria and viruses; test and evaluation of munitions, including performance in cold weather; studies of weapon-produced aerosols of potential BW agents; fundamental work related to field trials, dealing with the dispersion and properties of solid particulates, preparation of finely divided solids for munitions charging and sampling of toxic particulates; development of tissue culture processes for large scale cultivation of viruses; and development of *Burkholderia mallei* and *Burkholderia pseudomallei* as new potential BW agents and continued work on *Brucella suis* and *Pasteurella tularensis* as BW agents. There was no large scale production, stockpiling or weaponization of BW agents. When necessary, BW agents were destroyed by autoclaving.

3. Past defensive biological R&D programs:

a. Yes

b. 1 Jan 46 to present

c. A key factor in biological defence work is that it is only through a thorough understanding of the properties and behaviour of potential BW agents that the potential threat can be appreciated, and work on suitable defensive measures can be undertaken. Accordingly, in the past there was much basic research on such agents, as well as studies of their characteristics and behaviour as aerosols. The aerosol work included studies to delineate the factors responsible for the losses of viability in airborne bacteria and viruses during long-distance aerosol transport. The aim was to better understand the feasibility of large scale use of BW agents. Medical work in biological defence has covered research and development, and in some cases production of toxoids, antitoxins and vaccines for various potential BW agents including *Botulinum* toxin, Rinderpest virus, Newcastle Disease virus, *B. mallei*, *F. tularensis* and Diphtheria toxin. More recent work in biological defence is summarized in Form A, part 2.

CONFIDENCE BUILDING MEASURE G

Declaration of Production Facilities

List of Veterinary Biologics (vaccine) Manufacturing Facilities in Canada*

Includes facilities that are currently licensed to manufacture veterinary biologics under a *Veterinary Biologics Establishment Licence*, issued by the Veterinary Biologics Section of the Canadian Food Inspection Agency, under the *Health of Animals Act and Regulations*.

<u>Name of Facility</u>	<u>Location(s)</u>	<u>Activity</u>
Artemis Technologies Inc. Can. Vet. Biol. Estab. Lic. No. 50	Guelph, Ontario	Manufacturer of veterinary vaccines for use in animals.
Bioniche Life Sciences Inc. Can. Vet. Biol. Estab. Lic. No. 8	Belleville, Ontario	Manufacturer of veterinary vaccines and antibody products for use in animals.
Biovet Inc. Can. Vet. Biol. Estab. Lic. No. 49	Saint-Hyacinthe, Québec	Manufacturer of <i>in vitro</i> diagnostic test kits for diagnosis of animal diseases.
Gallant Custom Laboratories Inc. Can. Vet. Biol. Estab. Lic. No. 45	Cambridge, Ontario	Manufacturer of autogenous veterinary vaccines for use in animals.
Intervet Canada Corp. Can. Vet. Biol. Estab. Lic. No. 51	Kirkland, Quebec	Facility for labelling of veterinary vaccines for use in animals.
Pfizer Animal Health, Pfizer Canada Can. Vet. Biol. Estab. Lic. No. 4	Saanichton, British Columbia	Manufacturer of veterinary vaccines for use in aquaculture.
Novartis Animal Health Canada Inc. Can. Vet. Biol. Estab. Lic. No. 40	Mississauga, Ontario	Manufacturer of veterinary vaccines for use in farm animals
Novartis - Aqua Health Can. Vet. Biol. Estab. Lic. No. 40	Charlottetown (PEI) and Victoria (PEI)	Manufacturer of veterinary vaccines for use in aquaculture.
Nutratch Inc. Can. Vet. Biol. Estab. Lic. No. 58	Winnipeg, Manitoba	Manufacturer of egg antibody products for use in animals.
Saskatchewan Research Council, Fermentation Technologies Branch Can. Vet. Biol. Estab. Lic. No. 57	Saskatoon, Saskatchewan	Manufacturer of veterinary vaccines for use in animals.

Saskatoon Colostrum Co. Ltd. Can. Vet. Biol. Estab. Lic. No. 44	Saskatoon, Saskatchewan	Manufacturer of bovine colostrum products for administration to animals.
Vetcovac Ltée. Can. Vet. Biol. Estab. Lic. No. 48	Saint-Hyacinthe, Québec	Manufacturer of autogenous veterinary vaccines for use in animals.
Vetech Laboratories Inc. Can. Vet. Biol. Estab. Lic. No. 23	Guelph, Ontario	Manufacturer of veterinary vaccines for use in poultry.
Vétoquinol N.A. Inc. Can. Vet. Biol. Estab. Lic. No.34	Lavaltrie, Québec	Facility for packaging and labelling of veterinary vaccines for use in animals.