Treasury Board of Canada Secretariat
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Supplementary information tables: 2017–18 Departmental Plan

National Research Council Canada

Canada

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Table 1: Details on transfer payment programs of $5 million or more

General information

Name of transfer payment program	International Astronomical Observatories Program
Start date	1978
End date	Ongoing
Type of transfer payment	Contribution
Type of appropriation	Estimates
Fiscal year for terms and conditions	2015-16
Link to department's Program Inventory	Program: Science Infrastructure and Measurement Subprogram: National Science Infrastructure

Description	Astronomy has become a global science. The increasing cost of leading-edge observatories and the scarcity of ideal observation sites have led to a greater focus on international collaboration for large-scale astronomy projects which lead to advances in our knowledge and understanding of the universe. NRC, in collaboration with other international bodies, provides financial contributions to support the management and operations of offshore ground-based observatories and their related facilities, including the Canada-France-Hawaii Telescope (CFHT), the twin telescopes of the Gemini Observatory and the Atacama Large Millimeter Array (ALMA). NRC participates in the oversight and direction of these facilities and their research capabilities. NRC also represents Canada in the Square Kilometre Array (SKA) consortium for the pre-construction phase of the telescope. In 2015, Canada joined the international partnership to participate in the Thirty Metre Telescope (TMT). NRC, on behalf of Canada, provides both financial and in-kind contributions. International agreements governing these observatories are long-term commitments that specify contributions to support preconstruction design and development, construction, operation and maintenance, capital improvements (e.g., development of new astronomical instruments and other facility upgrades) and decommissioning of the international ground-based observatories and their related facilities. In addition, they include commitments to support the university-based user communities to ensure a fair and progressive use of these observatories. NRC participates in the governance of these international facilities on behalf of the Canadian astronomy research community and provides appropriate support, including sophisticated data management services and instrumentation. Through NRC's financial and in-kind contributions, the Canadian astronomy community is assured merit-based access to these facilities with appropriate support. Recipients are not required to repay funds obtained under this transfer payment program.
Expected results	• Canadian astronomers have access to leading-edge facilities and technology. • Qualified students and post-doctoral researchers have access to facilities to advance their training. • Canada plays a prominent role in international scientific endeavours. • Scientific benefit of telescopes to the Canadian and the global community is maximized through progressive science programs using leading-edge instrumentation. • Canadian industry has opportunities to participate in advanced scientific projects and opportunities to benefit from contracts and technology development.
Fiscal year of last completed evaluation	2016-17
Decision following the results of last evaluation	Continuation
Fiscal year of planned completion of next evaluation	2021-22

General targeted recipient groups	Foreign States, intergovernmental organizations or corporations that operate international observatories that have entered into agreements with Canada (NRC) to support costs related to ground-based astronomical observatories. In the case of intergovernmental organizations, Canada and one or more foreign states are members. An eligible recipient can be a Canadian Crown Corporation or other delivery partner.
Initiatives to engage applicants and recipients	NRC manages observatories established or maintained by the Government of Canada for the benefit of the Canadian astronomy research community, aligning its contributions to the priorities of the community's Long Range Plan for Astronomy and Astrophysics. NRC participates on the Boards which oversee the observatories to ensure that the science directions and programs of the facilities reflect Canadian strengths and interests. In addition, NRC ensures that these activities increase opportunities for Canadian researchers and firms to develop relevant instrumentation for the observatories. To carry out its roles effectively, NRC provides current information about each observatory to research community-based committees of scientists which provide expert advice on observatory operations and development. NRC provides extensive support to the user community through numerous services extending from administering the time allocation process for Canadian researchers through to delivery of science-ready data (through its Canadian Astronomy Data Centre).

Planning information (dollars)

Type of transfer payment	2016–17 Forecast spending[1]	2017–18 Planned spending[2]	2018–19 Planned spending[3]	2019–20 Planned spending[3]
Total grants	0	0	0	0
Total contributions	25,264,287	99,610,312	58,520,221	28,334,892
Total other types of transfer payments	0	0	0	0
Total program	25,264,287	99,610,312	58,520,221	28,334,892

1 *Forecast spending amount for 2016-17 of $25.3M reflects planned spending of $69.0M, decreased by $46.6M to reprofile funding to 2017-18 and the exclusion of $2.3M in capital funding. These decreases are offset by a net operating to G&C conversion of $5.16M, of which the majority relates to foreign exchange fluctuations*

2 *Planned Spending amount for 2017-18 of $99.6M reflects the existing funding of $54.1M, an increase by $46.6M from the 2016-17 re-profile funding and the exclusion of $1.1 capital funding*

3 *Planned Spending amounts for 2018-19 and 2019-2020 reflect the existing funding.*

General information

Name of transfer payment program	TRIUMF
Start date	April 1, 1977
End date	Ongoing
Type of transfer payment	Contribution
Type of appropriation	Estimates
Fiscal year for terms and conditions	2015-16
Strategic Outcome	R&D infrastructure for an innovative and knowledge-based economy
Link to department's Program Inventory	Program: Science Infrastructure and Measurement
Description	TRIUMF is Canada's national laboratory for nuclear and particle physics, and accelerator-based science. The laboratory is one of Canada's key investments in large-scale research infrastructure. It provides world-class facilities for research in sub-atomic physics, accelerator science, life sciences and materials science. A consortium of 19 Canadian universities (12 full members and 7 associate members) owns and operates TRIUMF. TRIUMF receives its federal funding through NRC in five-year allocations via a Contribution Agreement. NRC plays an important oversight and stewardship role for TRIUMF on behalf of the Government of Canada. TRIUMF was allocated $267.3M in Budget 2014 and 2015 for base operations over the 2015 – 2020 period. Recipients are not required to repay funds obtained under this transfer payment program.
Expected results	TRIUMF will continue to support the Canadian and international particle and nuclear physics community in alignment with the recently-released 2017-2021 Canadian Subatomic Physics Long Range Plan. Key TRIUMF priorities include: • Advancing the construction of TRIUMF's flagship Advanced Rare Isotope Laboratory (ARIEL). Following the successful completion of the first phase of the project in 2014, full funding for the second phase (ARIEL II) was confirmed in October 2016. Once completed, ARIEL's new accelerator and target facilities – together with the main cyclotron and ISAC facility at TRIUMF – will solidify Canada's place as a global leader in the production and study of rare isotopes for science, medicine, and business. • Supporting extraction and analysis of data from the T2K experiment in Japan, which studies the elusive properties of neutrinos, providing insights into the earliest moments of the universe. • Assisting with Canadian participation in research and experiments at the

	European Laboratory for Particle Physics (CERN). • Constructing and commissioning the Canada-Japan Ultra-Cold Neutron source at TRIUMF, which is designed to enable higher precision measurement of neutron properties for improving the understanding of the laws of physics. • Strengthening Canada's position in personalized medicine and the use of isotopes in life sciences through collaborations with clinical partners such as the British Columbia Cancer Agency and the University of British Columbia. Expected Results include: • Producing world-class science across TRIUMF's core programs and advancement of the ARIEL facility. • Continuing to attract and retain global talent, and continued support for international research collaborations and partnerships. • Growing TRIUMF's industry and community linkages with the objective of increasing the economic and societal benefit delivered to Canada. • Enhanced operational efficiency through the continuous improvement of project management procedures, the refreshment of safety processes, and the reassessment of human resource requirements against the needs of the laboratory's core program.
Fiscal year of last completed evaluation	2013-14
Decision following the results of last evaluation	Continuation
Fiscal year of planned completion of next evaluation	2018-19
General targeted recipient groups	Non-profit organizations (TRIUMF)

Initiatives to engage applicants and recipients	NRC chairs the Agency Committee on TRIUMF (ACT), which includes the key federal agencies that fund activities at TRIUMF, providing TRIUMF management the opportunity to update the Committee on progress and discuss future directions for the facility. NRC also manages the Advisory Committee on TRIUMF (ACOT), composed of international experts within disciplines that cover the research and technology activities of TRIUMF. ACOT reports its findings to NRC twice annually, making recommendations on programs and management as well as reporting on the scientific and technological achievements of TRIUMF programs and facilities. Representatives of the National Sciences and Engineering Research Council of Canada (NSERC), the Canadian Institute of Nuclear Physics and the Canadian Institute of Particle Physics are observer members who ensure that TRIUMF's directions are well aligned with the research community's needs and that TRIUMF is working with all constituencies of the Canadian sub-atomic physics community. The Committee considers all aspects of the TRIUMF program, with a particular emphasis on science and technological issues to ensure the relevance, impact and world class standing of TRIUMF S&T programs. Both ACT and ACOT engage in extended discussions with TRIUMF's management, ensuring that investments made on behalf of the research community are optimal. Through NRC activities in ACT and ACOT, NRC maintains a close relationship with TRIUMF. Dialogue is maintained between NRC and the recipient to ensure that investments made by the Government of Canada are optimal, and that NRC meets the needs of its recipient as well as providing a vehicle for feedback on the transfer payment management process. TRIUMF has 402 staff, postdoctoral researchers, and graduate students supported through the TRIUMF contribution agreement. An additional 112 positions are funded through other sources. In total, TRIUMF provides training for approximately 150 to 200 undergraduate, graduate students, and post doctoral fellows per year. TRIUMF operates a strong outreach program with multiple points of entry. By connecting with young people, students, teachers, and the general public, TRIUMF is building a thriving base of engagement that leverages its unique facilities to build awareness and excitement around the laboratory's world-leading science program. In parallel, TRIUMF actively invests in the growth and development of the future generations of talent through professional skills development for its student and postdocs communities.

Planning information (dollars)

Type of transfer	2016–17 Forecast spending[4]	2017–18 Planned spending[4]	2018–19 Planned spending[4]	2019–20 Planned spending[4]

[4] Forecast Spending of $53.7M for 2016-17 and Planned Spending for 2016-17 to 2019-20 reflect the existing funding level, which includes NRC's permanent reference level of $19.3M and the incremental funding announced in Budget 2014 and

payment				
Total grants	0	0	0	0
Total contributions	53,672,800	54,572,800	55,262,800	55,162,800
Total other types of transfer payments	0	0	0	0
Total program	53,672,800	54,572,800	55,262,800	55,162,800

Budget 2015 as well as a transfer from the National Sciences and Engineering Research Council (NSERC) of $442,800/per fiscal year

General information

Name of transfer payment program	Industrial Research Assistance Program (IRAP)
Start date	April 1, 2013
End date	Ongoing
Type of transfer payment	Contribution
Type of appropriation	Estimates
Fiscal year for terms and conditions	2012-13
Strategic Outcome	Canadian businesses prosper from innovative technologies
Link to department's Program Inventory	Industrial Research Assistance Program (IRAP)
Description	The Program contributes to the growth and prosperity of Canadian small and-medium sized enterprises (SMEs) by stimulating innovation, adoption and/or commercialization of technology-based products, services, or processes in Canada. This is done through: 1) technical and related business advice and networking facilitated by a cross-Canada network of field professional staff; 2) cost-shared merit-based contributions; and 3) contributions supporting employment of post-secondary graduates. This Program uses funding from the following transfer payments: Contributions to Firms; Contributions to Organizations; and Youth Employment Program (YEP). NRC IRAP supports the placement of graduates in SMEs through its participation in the delivery of YEP sponsored by Employment and Social Development Canada's Youth Employment Strategy (YES). Recipients are not required to repay funds obtained under this transfer payment program.
Expected results	• Stimulation of innovation in small and medium-sized enterprises (SMEs) in Canada. • Increased growth of innovative SMEs and creation of wealth for Canada
Fiscal year of last completed evaluation	2012-13
Decision following the results of last evaluation	Continuation
Fiscal year of planned completion of next	2017-18

evaluation	
General targeted recipient groups	Industry-related — For-profit businesses (SMEs) and Non-profit Organizations
Initiatives to engage applicants and recipients	NRC IRAP is a national program managed on a regional basis with over 240 Industrial Technology Advisors (ITAs) located in approximately 100 communities across the country, who provide customized advice to technologically innovative small and medium-sized enterprises (SMEs). ITAs are engaged with client SMEs throughout the entire contribution management process, from building project proposals through to project completion. At the end of their funded project, recipients are required to complete an online Post-Project Report. This assessment captures information on the recipient's experience with NRC IRAP and, along with published service standards, is used by the program to develop continuous program improvements. NRC IRAP has an Advisory Board composed of 10 to 12 members from the industry sector and industry associations. This Board provides advice to NRC IRAP management and brings an external perspective on the strategic directions and management of the program. NRC IRAP is actively engaged with Treasury Board Secretariat Grants and Contributions Reform. Participation in workshops and constant alignment with recent Treasury Board Secretariat policy and guidelines has enabled the program to steadily move toward principles such as a Recipient Engagement Strategy.

Planning information (dollars)

Type of transfer payment	2016–17 Forecast spending[5]	2017–18 Planned spending[6]	2018–19 Planned spending [7]	2019–20 Planned spending
Total grants	0	0	0	0
Total contributions	245,644,000	176,644,000	176,754,000	177,014,000
Total other types of transfer payments	0	0	0	0
Total program	245,644,000	176,644,000	176,754,000	177,014,000

[5] Forecast Spending amount of $245.6M for 2016-17 reflects the planned funding of $177.0, increases by $50.0M for IRAP contributions and $10.0M for Youth Green contributions announced in Budget 2016-17, a $10.0M transfer from Operations to Grant and Contributions, and a decrease by $1.37M to transfer funding from IRAP to Canada Accelerator and Incubator Program (CAIP).

[6] Planned Spending in 2017-18 reflects the planned spending of $177.0M and a decrease by $0.370M to transfer funding from IRAP to CAIP

[7] Planned Spending in 2018-19 reflects the planned spending of $177.0M and a decrease by $0.260M to transfer funding from IRAP to CAIP

General information

Name of transfer payment program	Canada Accelerator and Incubator Program (CAIP)
Start date	October 1, 2013
End date	March 31, 2019
Type of transfer payment	Contribution
Type of appropriation	Estimates
Fiscal year for terms and conditions	2013-14
Strategic Outcome	Canadian businesses prosper from innovative technologies
Link to department's Program Inventory	Industrial Research Assistance Program (IRAP)
Description	The CAIP is a 5-year non-repayable contribution program, aimed at establishing a critical mass of outstanding business incubators and accelerators that can develop innovative, high-growth firms, which themselves represent superior early-stage investment opportunities.
Expected results	• Early-stage firms have access to innovation support services. • Early-stage firms improve investment readiness. • Wealth creation in Canada.
Fiscal year of last completed evaluation	2016-17
Decision following the results of last evaluation	Continue and pursue identified opportunities to strengthen program delivery
Fiscal year of planned completion of next evaluation	2018-19
General targeted recipient groups	Non-profit Organizations
Initiatives to engage applicants and recipients	CAIP supports SMEs' access to best-in-class business accelerators and incubators with the goal of helping these organizations expand their overall service offerings. Organizations were selected based on CAIP specific eligibility criteria and selection guidelines. CAIP is a direct result of extensive consultations, undertaken by Finance Canada in 2012, which revealed that, in addition to the availability of venture capital, entrepreneurs also require access to specialized innovation resources to succeed.

Planning information (dollars)

Type of transfer payment	2016–17 Forecast spending[8]	2017–18 Planned spending[9]	2018–19 Planned spending[10]	2019–20 Planned spending
Total grants	0	0	0	0
Total contributions	25,815,885[1]	24,565,885	17,355,791	0
Total other types of transfer payments	0	0	0	0
Total program	25,815,885[1]	24,565,885	17,355,791	0

8 Forecast Spending for 2016-17 of $25.8M reflects the planned spending of $24.4M plus a $1.37M transfer from IRAP to CAIP.

9 Planned Spending for 2017-18 of $24.6M reflects the planned spending of $24.2M plus a $0.37M transfer from IRAP to CAIP.

10 Planned Spending for 2018-19 of $17.4M reflects the planned spending of $17.1M plus a $0.26M transfer from IRAP to CAIP. The Program will sunset in 2018-19.

Table 2: Disclosure of transfer payment programs under $5 million

General information

Name of transfer payment program	International Affiliations Program
End date	N/A
Type of transfer payment	Grant
Type of appropriation	Estimates
Link to department's Program Inventory	Internal Services
Main objective	Canada's membership in international S&T organizations promotes international market-oriented research and innovation, networking, advocacy, leadership and benchmarking opportunities as well as access to research and benchmarking possibilities, enabling Canadian science, technology, and industry to remain competitive.
Planned spending for 2017-18 (dollars)	560,000
Fiscal year of last completed evaluation	2015-16
General targeted recipient groups	International organizations and foreign countries. (Foreign recipients which are international scientific and technological (S&T) organizations having two or more states as members. As well, non-foreign recipients are non-governmental Canadian delegates who attend related meetings hosted by these foreign recipients).

Name of transfer payment program	Assessed Contribution to the Bureau International des Poids et Mesures (BIPM)
End date	N/A
Type of transfer payment	Contribution
Type of appropriation	Estimates
Link to department's Program Inventory	Science Infrastructure and Measurement, Measurement Science and Standards
Main objective	By representing Canada on the international metrology stage through its affiliation with the BIPM, NRC is able to more effectively and efficiently respond to NRC's mandated responsibility for maintenance of national measurement standards, as articulated in the NRC Act and the Weights and Measures Act.
Planned spending for 2017-18 (dollars)	659,000
Fiscal year of last completed evaluation	2015-16
General targeted recipient groups	International organizations and foreign countries. (Bureau international des poids et mesures (BIPM) is an annual assessed contribution reflecting Canada's status as a State Party to the Metre Convention Treaty since 1907).

Table 3: Horizontal initiatives

General information

Name of horizontal initiative	Genomics R&D Initiative (GRDI)
Lead department(s)	National Research Council Canada (NRC)
Federal partner organization(s)	Agriculture and Agri-Food Canada (AAFC), Canadian Food Inspection Agency (CFIA), Fisheries and Oceans Canada (DFO), Environment Canada (EC), Health Canada (HC), National Research Council Canada (NRC), Natural Resources Canada (NRCan), Public Health Agency of Canada (PHAC). Canadian Institutes for Health Research (CIHR) received a onetime allocation in 1999-2000.
Non-federal and non-governmental partner(s)	Not applicable
Start date of the horizontal initiative	April 1999, renewed in 2002-03, 2005-06, 2011-12, and 2014-15
End date of the horizontal initiative	March 2019
Total federal funding allocated (start to end date) (dollars)	393,300,000
Total federal planned spending to date (dollars)	333,600,000
Total federal actual spending to date (dollars)	332,300,000
Funding contributed by non-federal and non-governmental partners	Not applicable
Governance structures	An interdepartmental Assistant Deputy Minister (ADM) Coordinating Committee (CC) has been established to oversee collective management and coordination of the federal GRDI. It is chaired by the lead agency (NRC) with membership at the ADM-level from each of the organizations receiving funding and guest representatives from Industry Canada and Genome Canada. It is responsible for the overall strategic direction for the GRDI and approval of investment priorities. It ensures that effective priority setting mechanisms are established within departments and agencies, and that government objectives and priorities are addressed. The Committee also ensures that common management principles are implemented and collaborations between organizations are pursued wherever relevant and possible. It typically meets three times a year at the call of the Chair, more often when warranted by specific needs for decision-making. An Interdepartmental Working Group (WG) supports the work of the committee.

	It is chaired by the lead agency (NRC) with membership at the Director level from all participating departments/agencies, and Industry Canada. The mandate of the WG is to provide recommendations and strategic advice to the ADM CC regarding strategic priority setting and overall management of the GRDI. The WG is responsible for providing direction to GRDI program activities related to operational delivery, implementation planning and investment priority setting. The WG also supports evaluation and reporting requirements related to the Initiative. It meets about every two months, more often when warranted by specific needs for recommendations and advice, as well as to develop and approve the GRDI Annual Performance Report. A Coordination Function, housed at NRC, provides GRDI-wide program coordination, communication, networking and outreach support. This includes support to the ADM CC and the GRDI WG, transparent and effective communication to departments of the planning cycle, process requirements, financial administration and other project management requirements, and support for interdepartmental shared project planning and implementation. This function is also responsible for conducting studies and analyses to serve as input to determination of GRDI-wide research priorities, and providing management and administration support, as well as support for performance management, reporting, evaluation, and communications.
Contact information	Roman Szumski Vice-President, Life Sciences National Research Council Canada (613) 993-9244

Results information

Description of the horizontal initiative	The Genomics R&D Initiative (GRDI) supports genomics research inside federal government laboratories. It focuses on mandates and priorities of participating departments and agencies. Research supported by the GRDI covers areas such as health care, food safety and global food security, sound management of natural resources, a sustainable and competitive agriculture sector, and environmental protection, with collaboration with university and private sectors. Since the implementation of the GRDI in 1999, participating departments and agencies have built a solid genomics research capacity and have gone a long way to deliver on the Initiative's stated objectives, as confirmed by two independent evaluations (2006 and 2011) and an audit by the Office of the Comptroller General (2012). Additional information may be found on the .
Fiscal year of planned completion of next evaluation	2021-22

Shared outcome of federal partners	The GRDI Horizontal Performance Measurement Strategy was updated for Phase VI. The updated version covers fiscal years 2014-2015 to 2018-2019 and formalizes the roles and responsibilities of the eight departments and agencies involved in the Initiative to support effective monitoring and evaluation activities. It presents three intermediate outcomes: 1) Federal science departments and agencies are positioned as genomics research leaders; 2) Research results are used to inform government regulatory, policy, and/or resource management decisions; and 3) Research results are used by stakeholders to support innovation in Canada; contributing to the Government of Canada Outcomes: Healthy Canadians; Strong economic growth; An innovative and knowledge-based economy; and A clean and healthy environment.
Performance indicator(s)	GDRI is managed using a comprehensive performance measurement framework to gauge progress towards the above 3 shared outcomes. Examples of performance indicators include: 1) Scientific production and impact in genomics 2) Case analysis of examples where risk assessment, regulatory, policy, and resource management decisions have been informed by GRDI research (federal, provincial, municipal) 3) Case analysis of examples where innovative tools and processes have been adopted in Canada based upon GRDI research
Target(s)	Targets for the above examples are: 1) On par or better than other genomics researchers in Canada 2) Positive impact based on qualitative case study analysis 3) Positive impact based on qualitative case study analysis
Data source and frequency of monitoring and reporting	The data for the above examples is derived from program Evaluation every 5 years
Expected outcome or result of non-federal and non-governmental partners	Not applicable

Planning information

Planning summary

Federal organizations	Link to departmental Program Inventory	Contributing programs and activities	Total allocation (from start to end date) (dollars)	2017–18 Planned spending (dollars)	2017–18 Expected results	2017–18 Performance indicators	2017–18 Targets	Link to department's Strategic Outcomes	Link to government priorities
AAFC	Science, Innovation, Adoption and Sustainability	Canadian Crop Genomics Initiative (CCGI)	108,500,000	4,440,000	ER1 ER2	PI1	T1 T2	An innovative and sustainable agriculture, agri-food and agri-based products sector	A Clean Environment and a Strong Economy
CFIA	Food Safety Program, Animal Health and Zoonotics Program, Plant Resources Program	GRDI	3,600,000	720,000	ER3	PI3.1 PI3.2	T3	A Safe and Accessible Food Supply and Plant and Animal Resource Base	A Clean Environment and a Strong Economy
DFO	Biotechnology and Genomics	National Aquatic Biotechnology and Genomics R&D Strategy	16,495,000	720,000	ER4	PI4	T4	Economically Prosperous Maritime Sectors and Fisheries	A Clean Environment and a Strong Economy
EC	Climate Change and Clean Air	Strategic Technology Applications of Genomics in the Environment (STAGE)	18,550,000	800,000	ER5	PI5	T5	Threats to Canadians and their environment from pollution are minimized	A Clean Environment and a Strong Economy

Federal organizations	Link to departmental Program Inventory	Contributing programs and activities	Total allocation (from start to end date) (dollars)	2017–18 Planned spending (dollars)	2017–18 Expected results	2017–18 Performance indicators	2017–18 Targets	Link to department's Strategic Outcomes	Link to government priorities
HC[1]	Canadian Health System Policy Health System Priorities	GRDI	53,120,000	105,904	ER6	PI6	T6	A health system responsive to the needs of Canadians	A Clean Environment and a Strong Economy
	Health Products Biologics & Radiopharmaceuticals	GRDI	2,140,000	528,601	ER6	PI6	T6	Health risks and benefits associated with food, products, substances, and environmental factors are appropriately managed and communicated to Canadians	A Clean Environment and a Strong Economy
	Food Safety and Nutrition Food Safety	GRDI	930,000	235,964	ER6	PI6	T6	Health risks and benefits associated with food, products, substances, and environmental factors are appropriately managed and	A Clean Environment and a Strong Economy

Federal organizations	Link to departmental Program Inventory	Contributing programs and activities	Total allocation (from start to end date) (dollars)	2017–18 Planned spending (dollars)	2017–18 Expected results	2017–18 Performance indicators	2017–18 Targets	Link to department's Strategic Outcomes	Link to government priorities
								communicated to Canadians	
	Environmental Risks to Health Health Impacts of Chemicals	GRDI	2,910,000	729,531	ER6	PI6	T6	Health risks and benefits associated with food, products, substances, and environmental factors are appropriately managed and communicated to Canadians	A Clean Environment and a Strong Economy
NRC	Technology Development and Advancement	GRDI	108,500,000	4,440,000	ER1 ER7	PI7.1 PI7.2	T1 T7	Canadian businesses prosper from innovative technologies	A Clean Environment and a Strong Economy
		Shared Priorities	28,855,000	3,980,000	ER8	PI7.1 PI7.2	T8	Multiple Strategic Outcomes across departments	A Clean Environment and a Strong Economy
NRCan	Innovation for New	GRDI	36,100,000	1,600,000	ER9	PI9.1	T9	Canada's Natural	A Clean Environment

Federal organizations	Link to departmental Program Inventory	Contributing programs and activities	Total allocation (from start to end date) (dollars)	2017–18 Planned spending (dollars)	2017–18 Expected results	2017–18 Performance indicators	2017–18 Targets	Link to department's Strategic Outcomes	Link to government priorities
	Products and Processes					PI9.2		Resource Sectors are Globally Competitive	and a Strong Economy
PHAC	Public Health Infrastructure	GRDI	13,100,000	1,600,000	ER10	PI10.1 PI10.2	T10	Protecting Canadians and empowering them to improve their health	A Clean Environment and a Strong Economy
CIHR	N/A	N/A	500,000	0	N/A	N/A	N/A	N/A	N/A
Total for all federal organizations			393,300,000	19,900,000	Not applicable				

ER1

Using genomics to significantly increase Canada's share of global wheat production

PI1

Number of scientific outputs generated in the form of scientific papers

T1

NRC will continue to support the Canadian Wheat Improvement Program in the areas of tolerance to disease and abiotic stress, genomics-assisted breeding, and seed development. This program is NRC's contribution to the Canadian Wheat Alliance, a large-scale research alliance to improve the yield, sustainability, and profitability of Canadian wheat for the benefit of Canadian farmers and the economy. AAFC

supports the objectives of the Alliance through its Canadian Crop Genomics Initiative. The Alliance also includes major contributions by the University of Saskatchewan, and the Province of Saskatchewan. The target for the number of scientific outputs generated in the form of scientific papers is set at 45.

ER2

Using genomics to improve the value of Canadian crops and agri-products

T2

GRDI investments at AAFC will focus on the priorities outlined in the Canadian Crop Genomics Initiative, and will be leveraged to enable industry to take advantage of new innovative opportunities. Activities will fall under three broad themes: 1) Biodiversity, gene mining and functional analysis: to develop value-added traits (e.g. seed quality) for the highly competitive marketplace, enhancing the resiliency of Canada's crop production in the face of potentially catastrophic abiotic and biotic stresses and to maximize profitability for the sector. 2) Bioinformatics and physical tools: ensuring that scientists can maximize the opportunities presented by genomics-based research (e.g. identification and characterization of genes coding for desirable traits related to seed quality or disease resistance). 3) Improved access to biological materials and data sets: to enhance the efficiency of plant breeding to lay the scientific foundation for major advances in the development and delivery of priority traits identified by industry (e.g. disease resistance).

ER3

Using genomics for food safety, animal health and plant protection

PI3.1

Number of standard operating procedures/tools developed and/or transferred to end users to support risk management strategies

PI3.2

Number of scientific outputs generated in the form of publications, presentations and contributions to databases to support evidence-based regulatory, policy or resource management decisions

T3

Funds from GRDI will be targeted to increase the genomics capability within CFIA to support on-site diagnostic tools and surveillance capabilities. Specifically, GRDI activities will focus on three areas: 1) Food Safety: to better support CFIA in the areas of compliance testing, source attribution and risk profiling, enabling enforcement of Health Canada standards. 2) Plant Resources: to enable early detection and rapid response, and inform regulatory decision-making for regulated plant pests and plant commodities within the agricultural and forestry sectors. 3) Animal Health: to support management of public health risks associated with the transmission of zoonotic diseases and reportable and emerging animal diseases.

ER4

Genomics knowledge and advice for the management of fisheries and oceans

PI4

Percentage of GRDI projects that provided genomics knowledge and advice to decision makers

T4

Genomics-enabled research within DFO will continue to be aligned within the following themes: 1) Protecting fish species and enabling sustainable harvesting: to develop and apply leading-edge genomics tools to accurately identify species, farmed/wild interactions, populations and stocks for fisheries management and the conservation of vulnerable stocks, species at risk and aquatic biodiversity. 2) Safeguarding Canadian fish and seafood products: to develop innovative genomics techniques to detect, monitor and minimize the impact of pathogens (e.g. Infectious Salmon Anemia virus) in order to safeguard the health of Canada’s aquatic resources and our export markets for fish and seafood products. 3) Maintaining healthy and productive aquatic ecosystems: to develop and apply new genomics tools to monitor, mitigate and restore aquatic ecosystems.

ER5

Genomics-based tools and technologies for responsible decision-making

PI5

Increased awareness and understanding of the five Strategic Technology Applications of Genomics in the Environment (STAGE) research priorities

T5

EC will continue to deliver its GRDI funding under the STAGE program, in the following areas: 1) Chemical and biological risk assessment: to establish toxicology end points for microorganisms, chemicals of concern, and emerging stressor; and to predict the mode of action of chemicals of concern and their effects on organisms; 2) Wildlife conservation: to understand how genes are interacting in flora and fauna in response to environmental conditions and to track disease in wildlife; 3) Environmental monitoring: to develop indicators (e.g., gene expression profiles for key species) of ecosystem health in priority ecosystems (e.g., Great Lakes and St. Lawrence) and to track pathogen sources; and 4) Compliance and Enforcement: to analyze flora and fauna for individual species identification, parentage determination and ascertaining geographic origin. This work will enable the delivery of EC's obligation under the Fisheries Act and the Canadian Environmental Protection Act, and programs including the Chemicals Management Plan.

ER6

Genomic knowledge for the Canadian health regulatory system

PI6

Percentage of targeted knowledge transfer activities accomplished related to genomic research (e.g., client meetings, poster/conference presentations, and peer-reviewed publications)

T6

Genomics research will continue to focus on four priority investment areas to strengthen HC's regulatory role: 1) Supporting regulatory knowledge on therapeutics and biologics: to inform and support regulatory decisions throughout the biotherapeutic product life-cycle. Specifically, HC will continue with research projects on vaccines and emerging stem cell based projects. During the 2017-18 fiscal year, HC stem cell research will identify molecules that can be used to monitor the safety and effectiveness of mesenchymal stem cell based products. In addition, vaccine research projects will be developing a list of immune cell markers that can be used to improve current methods for monitoring the efficacy and safety of Respiratory Syncytial Virus vaccines. 2) Supporting regulatory knowledge on food safety and nutrition: enabling detection and characterization of food-borne micro-organisms; characterization of health effects of food

contaminants, allergens, nutrients, novel foods/food ingredients, and pre- and pro-biotics; and development of markers of health status and disease (e.g. cancer, diabetes, obesity, allergies and cardiovascular disease) in the context of nutrition, micro-organisms, allergens and food contaminant exposure. 3) Protecting human health from potential adverse effects of environmental contaminants, radiation, consumer products and pesticides. 4) Research on socio-ethical impacts of genomics technologies, outputs and products: approaches for responsible integration of genomics for societal benefit, taking into account ethical, legal and socio-economic considerations.

ER7

Commercially-relevant advances in genomics R&D related to human health

PI7.1

Technology deployment (client commitments to exploit NRC innovations)

PI7.2

Client/stakeholder feedback on benefits: jobs, sales, R&D

T7

GRDI investments in NRC will be made in program areas that require genomics to help industry and government tackle strategic national priorities (e.g. strong economic growth, healthy Canadians, innovative and knowledge-based economy) through mission-oriented research and technology deployment. GRDI's human health-related focus will support NRC's Biologics and Subsequent Entry Biologics program. This program was approved for implementation by NRC's Senior Executive Committee after undergoing a rigorous program approval and implementation process.

ER8

Concerted interdepartmental research along shared priorities and common goals on issues that are beyond the mandates of single departments

PI8

Percentage of projects disseminating results to identified end users

T8

Two shared priority projects will continue their activities in 2017-2018. The Antimicrobial Resistance project will develop a greater understanding of the critical activities that contribute to the development of antimicrobial resistance and critical exposure pathways by which antimicrobial bacteria reach humans, which could then be used to help validate economically sustainable technologies, practices, and policies to mitigate the development of antimicrobial resistance; it is a component of the Federal Action Plan for Antimicrobial Resistance and Use in Canada. The Metagenomic-Based Ecosystem Biomonitoring (EcoBiomics) project will develop advanced genomics tools to monitor the water quality of rivers and lakes, assess the biodiversity of freshwater invertebrates and microorganisms, evaluate the health of soil essential to the productivity of agricultural and forestry systems across Canada, and investigate land remediation for the oil and mining sectors. The main impact of this project will be to support environmental responsibility, secure market access for resource products and improve social license for economic development in Canada.

ER9

Genomic knowledge for forest generation and protection

PI9.1

Number of new products and processes resulting from NRCan information

PI9.2

R&D expenditures in natural resource sectors, specifically total intramural R&D expenditures in energy, mining and forest sectors

T9

The Canadian Forest Service of NRCan will focus on accelerating the translation of accumulated genomics knowledge into applications in support of Canada's forest sector competitiveness, including: 1) Forest generation: the development of innovative genomic applications will result in accelerated production of higher quality fibre, translating into economic and environmental benefits for Canada. 2) Forest protection: the development of innovative genomic diagnostic tools will enable rapid detection and management of invasive insects and diseases which threaten the health and ecological integrity of Canadian forests, the forest sector and forest communities.

ER10

Genomics knowledge to strengthen public health programs and activities related to infectious and chronic disease

PI10.1

Percent of clients indicating overall satisfaction with laboratory reference services as “satisfied” or “very satisfied”

PI10.2

Number of citations to agency laboratory research publication to demonstrate knowledge transfer uptake

T10

The genomic study of pathogens and their traits associated with infectious diseases generate rapid and cost effective new approaches to disease surveillance, prevention, and control (e.g. molecular tools to better identify organisms associated with disease outbreaks). GRDI research activities at PHAC apply “-omics” technologies to generate new knowledge to support public health decision making, and to create new tools to enhance disease prevention and control. These technologies are providing methods to enhance: 1) the prevention and control of priority pathogens; 2) the response to antimicrobial resistant pathogens; 3) infectious disease surveillance; and 4) public health security measures. The knowledge generated from genomic approaches is supporting more detailed risk analyses, as well as the identification and development of new intervention points for the control and prevention of infectious diseases. The targets for PI10.1 and 10.2 are set at 90% and 1800 respectively.

Table 4: Upcoming evaluations over the next five fiscal years

Programs planned to be evaluated in the next five years

Fiscal year (of the planned date for deputy head approval of the evaluation report)	Title of the evaluation	Completion of last evaluation	Link to department's Program Inventory	Planned spending associated with the program(s) evaluated (dollars)[11]
2017-18	Evaluation of the Industrial Research Assistance Program (IRAP)	2012-13(IRAP) 2013-14 (DTAPP[12]) 2016-17 (BIAP)[13]	Industrial Research Assistance Program (IRAP)	244,557,189 excluding Canadian Accelerator Incubator Program (CAIP)
2017-18	Evaluation of NRC Security and Disruptive Technologies	No previous evaluation (currently underway)	Security and Disruptive Technologies (Sub-program)	12,681,064 excluding estimated planned spending by National Institute for Nanotechnology
2017-18	Evaluation of NRC Information and Communication Technologies (ICT)	2016-17 (ILTG[14]) No previous evaluation of the subprogram as a whole	Information and Communication Technologies (Sub-program)	31,275,936
2018-19	Evaluation of NRC Energy, Mining and Environment	No previous evaluation	Energy, Mining and Environment (Sub-program)	23,670,635

[11] Planned Spending values are calculated for three years. All information beyond three years is based upon 2019-20 calculated values.

[12] Digital Technology Adoption Pilot Program, a former subset of IRAP.

[13] Business Innovation Access Program, a former subset of IRAP.

[14] Interactive Language Technologies Group, a subset of the ICT subprogram.

Fiscal year (of the planned date for deputy head approval of the evaluation report)	Title of the evaluation	Completion of last evaluation	Link to department's Program Inventory	Planned spending associated with the program(s) evaluated (dollars)[11]
2018-19	Evaluation of NRC Aerospace	Institute for Aerospace Research – 2011-12	Aerospace (Sub-program)	54,953,484
2018-19	Evaluation of NRC's Contribution to TRIUMF	2013-14	Science Infrastructure and Measurement (Program)	55,262,800
2018-19	Evaluation of the Canadian Accelerator Incubator Program (CAIP)	2016-17	Industrial Research Assistance Program (IRAP)	17,355,791
2018-19	Evaluation of NRC Automotive and Surface Transportation	Surface Transportation Subprogram – 2013-14	Automotive and Surface Transportation (Sub-program)	38,588,287
2019-20	Evaluation of NRC Construction	2013-14	Construction (Sub-program)	22,041,570
2019-20	Evaluation of the NRC Measurement Science and Standards Portfolio Assessed Contribution to the Bureau International des Poids et Mesures (Transfer Payment Program)	2015-16	Measurement Science and Standards (Sub-program)	23,983,050 (taking into account the Assessed Contribution to the Bureau International des Poids et Mesures Transfer Payment Program)
2019-20	Evaluation of NRC Human Health Therapeutics	2014-15	Human Health Therapeutics (Sub-program)	40,107,248
2020-21	Evaluation of the National Institute for Nanotechnology	2015-16	Security and Disruptive Technologies	7,873,079
2020-21	Evaluation of NRC Medical Devices	No previous evaluation	Medical Devices (Sub-program)	9,464,857
2021-22	Evaluation of NRC Ocean, Coastal and River Engineering	2016-17	Ocean, Coastal and River Engineering (Sub-program)	15,285,747

Fiscal year (of the planned date for deputy head approval of the evaluation report)	Title of the evaluation	Completion of last evaluation	Link to department's Program Inventory	Planned spending associated with the program(s) evaluated (dollars)[11]
2021-22	Evaluation of NRC Herzberg Astronomy and Astrophysics	2016-17	National Science Infrastructure (Sub-program)	48,938,532
2021-22	Evaluation of the Genomics R&D Initiative	2016-17	Technology Development and Advancement Program	8,420,000 (based upon 2015-16 actual spending)
2021-22	Evaluation of NRC Aquatic and Crop Resource Development	2016-17	Aquatic and Crop Resource Development (Sub-program)	27,669,071
Total organiza-tional spending	Not applicable	Not applicable	Not applicable	682,128,340

Programs with no planned evaluations in the next five years

Link to the departmental Program Inventory	Completion of last evaluation	Rationale for not evaluating in the current five-year cycle	Planned spending associated with the programs not planned to be evaluated (dollars)
Internal Services -- Grants to International Affiliations (Transfer Payment Program)	2015-16	The program has low materiality. There are no known issues with the program (based on frequently monitored performance data).	560,000
Total organizational spending	Not applicable	Not applicable	560,000

Total planned organizational spending in dollars (programs planned to be evaluated in the next five years plus programs with no planned evaluations in the next five years): 711,603,942

Table 5: Upcoming internal audits for the coming fiscal year

Internal audits

Title of internal audit	Internal audit subject	Status	Expected completion date
Audit of Business Continuity Plan	Security Management and Corporate Administrative Practices	Planned	November 2018
Audit of IT Governance	Information Technology Governance and Resource Management	Planned	November 2018
Audit of Business Development	Corporate Financial and Administrative Practices	Planned	November 2018