

**Federal Contaminated Sites Accelerated Action Plan
Annual Report
2004-2005**

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Executive Summary

The 2003 federal budget included a commitment of \$175 million in funding over two years followed by \$300 million over three years, resulting in the establishment of the Federal Contaminated Sites Accelerated Action Plan (FCSAAP) Program in June 2003. The FCSAAP is a collaborative effort among federal departments and agencies to ensure effective risk management and/or remediation of the highest-risk contaminated sites. These sites are the result of historic federal actions or operations, or are now the direct responsibility of the federal government, such as abandoned mines in the North.

FCSAAP provides a mechanism to accelerate the remediation of these higher-risk federal contaminated sites, thereby reducing their associated financial liabilities. Environment Canada and the Treasury Board Secretariat jointly administer the FCSAAP Program. The FCSAAP Secretariat is located within Environment Canada, and is the centre of the coordination activity.

In 2003-04, the groundwork was laid to establish a successful program. The second year of the FCSAAP Program built on these important steps. Additional guidance and training materials were developed and provided to custodians. Other key achievements included the development and enhancement of program policies and procedures.

This strong foundation has facilitated an almost three-fold increase in the number of priority contaminated sites where work was undertaken in the second year of the FCSAAP Program. The results obtained in 2004-2005 also show a significant increase in the number of assessment projects carried out during the fiscal year.

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1.0 Introduction

The Federal Contaminated Sites Accelerated Action Plan (FCSAAP) was created following the 2003 federal budget commitment of \$175 million over two years to address high-priority federal contaminated sites. The FCSAAP is a collaborative effort among 14 federal departments and agencies to identify, assess and prioritize contaminated sites for which they are responsible, and ensure that they are managed effectively based on the level of risk they pose to human health and the environment.

The FCSAAP Program has a number of objectives:

1. Accelerate action on federal contaminated sites based on human health and ecological risks;
2. Reduce federal financial liability¹ related to known federal contaminated sites;
3. Reduce human health and ecological risks at specific highest-risk federal sites; and,
4. Increase public confidence in the overall management of federal contaminated sites and in the risk-management/remediation of individual contaminated sites.

A contaminated site is defined as a site at which substances occur at concentrations: (1) above background levels (background is defined as an area not influenced by chemicals released from the site under evaluation) and pose or are likely to pose an immediate or long-term hazard to human health or the environment, or (2) exceeding levels specified in policies and regulations.² The contamination that exists on federal sites is a result of past federal actions or operations on federal lands that occurred at a time when the risks of such actions were not well understood. The federal government also manages contamination at sites that are now the responsibility of the federal government, such as abandoned mines in the North.

Prior to the creation of the FCSAAP, the majority of departments reallocated funding from other priorities in order to risk-manage or remediate federal contaminated sites. These funding reallocations have been estimated at \$100 million per year.³ Most of this spending was concentrated in a small number of departments responsible for significant contaminated sites.

Update

The 2004 federal budget provided \$3.5 billion for a major multi-year cleanup of contamination on federal lands. It is estimated that 60 percent of the spending will occur in the North, leading to economic development and employment opportunities for Aboriginal communities and Northern residents. Forty percent of the sites affected by this announcement are located in or near urban areas. This announcement led to the creation of the Federal Contaminated Sites Action Plan (FCSAP), a new longer-term program to replace FCSAAP beginning in 2005-06.

Program Structure

Environment Canada (EC) and the Treasury Board Secretariat (TBS) jointly administer the FCSAAP Program, which is delivered by 14 federal custodians. Three science-based expert support departments (Environment Canada, Health Canada (HC), and Fisheries and Oceans Canada (DFO)) provide technical and scientific expertise. The program is administered and coordinated by the FCSAAP Secretariat, which is located within Environment Canada. The TBS is responsible for policy guidance and administering the fund, in line with its role as a Budget Office.

Two interdepartmental groups provide support the FCSAAP Program:

1. **The Federal Contaminated Sites (FCS) ADM Steering Committee.** This Committee is co-chaired by Environment Canada and the TBS. It is composed of Assistant Deputy Ministers (ADM) from all federal custodians with contaminated sites and the Expert Support Departments, and provides overall direction

¹ CICA Public Sector Accounting Handbook – PS 3200: “Liabilities are present obligations of a government to others arising from past transactions or events, the settlement of which is expected to result in the future sacrifice of economic benefits”.

Three essential characteristics:

1. Little or no discretion to avoid settlement of obligation;
2. Future transfer of assets or provision of goods or services;
3. Transactions or events giving rise to obligation have already occurred.

Obligations are not liabilities unless they meet the three characteristics of liabilities.

² “A Federal Approach to Contaminated Sites”, developed by the Contaminated Sites Management Working Group, November 1999.

³ “Taking Action on Federal Contaminated Sites: An Environmental and Economic Priority”, Environment Canada, July 2005, page ii

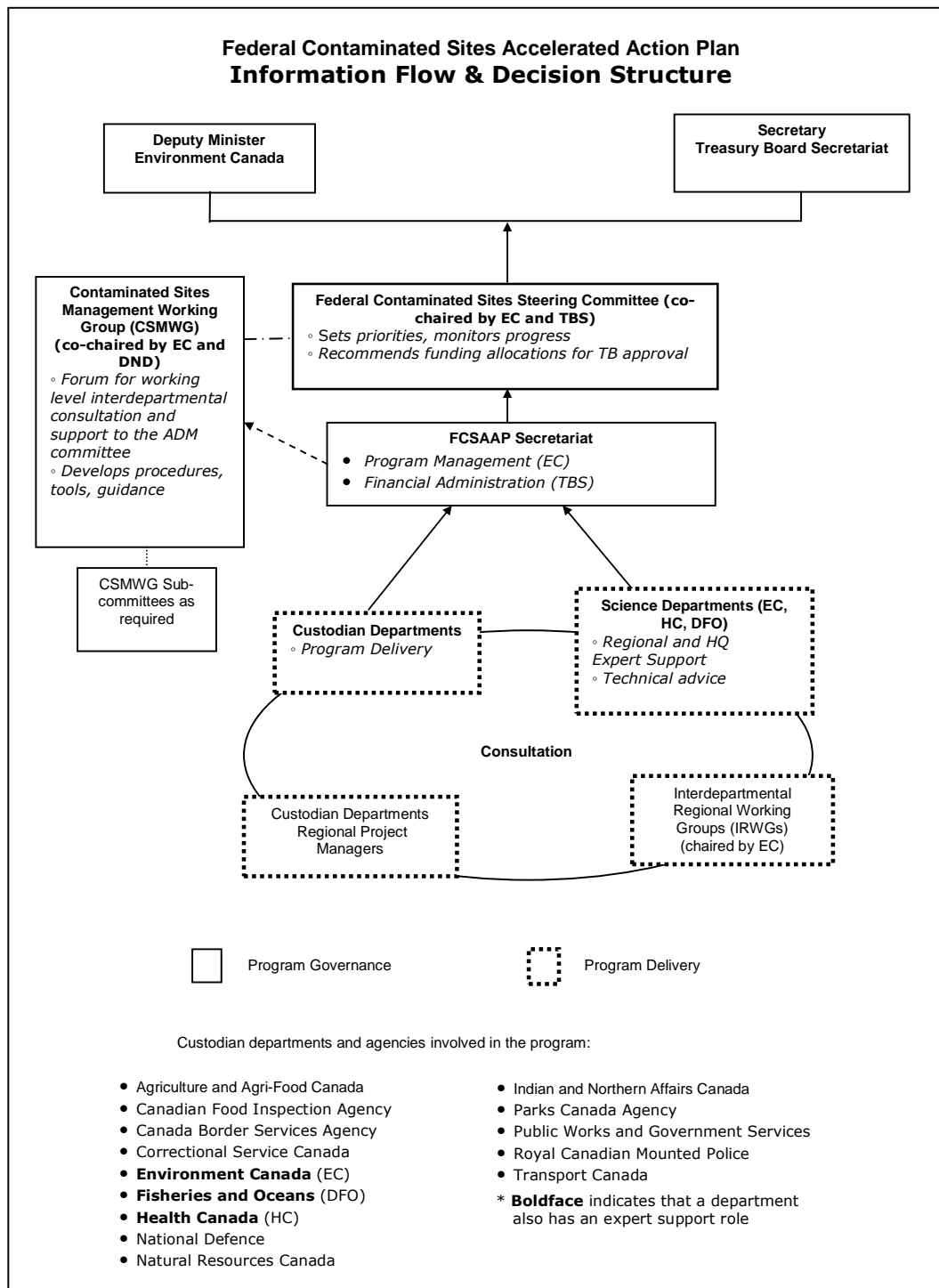
and accountability for the FCSAAP Program. The Committee oversees the implementation of the FCSAAP Program, and is responsible for setting program and project priorities, monitoring progress, and providing recommendations on the funding allocations for FCSAAP projects to the Deputy Minister of Environment and the Secretary of the TBS.

2. **The Contaminated Sites Management Working Group (CSMWG).** The CSMWG was originally established in 1995 to investigate and propose a common federal approach for the management of contaminated sites under federal custody and related issues. This working-level committee comprises all federal custodians with contaminated sites and the Expert Support Departments. CSMWG has contributed to the development of procedures, tools, guidance and other key FCSAAP Program outputs, as well as reviewing the list of high-risk sites.

Environment Canada, Health Canada and Fisheries and Oceans Canada (DFO) provide expert support and advice to the Secretariat and federal custodians. They develop and promote best practices to assist federal custodians in the adoption of a consistent approach to human health and ecological risk assessments. The activities undertaken by the Expert Support Departments are in-line with their specific departmental mandates – DFO ensures that prior, post and current site remediation or risk management activities do not further compromise fish or fish habitat resources, while Environment Canada and Health Canada focus on improving and promoting environmental and health risk assessments as a key part of the project selection process. The three Expert Support Departments are also responsible for:

- providing custodians with project-specific advice and guidance materials,
- assisting custodians in the management of health and ecological issues,
- liaising with provincial counterparts,
- advising on risk management, risk communication and communication strategies, and
- public outreach.

Figure 1



Program Administration

The FCSAAP was created to address the highest-risk federal contaminated sites with an estimated remediation cost of over \$1 million. These are Class 1 sites as defined by the Canadian Council of Ministers of the Environment (CCME) National Classification System (NCS).⁴ Sites with total estimated remediation/risk management costs under \$25 million receive funding based on a 70:30 cost-share ratio -- 70 percent of the funding is supplied by the FCSAAP Program and 30 percent is provided by the federal custodian. Project costs which exceed \$25 million are funded on a 90:10 cost-share basis.

Projects submitted by federal custodians are reviewed against selection criteria (see Appendix 4: FCSAAP Project Selection Methodology) by the Expert Support Departments, and ultimately by the FCSAAP Secretariat. Funding options are developed in consultation with the interdepartmental Contaminated Sites Management Working Group (CSMWG). The FCSAAP Secretariat endeavours to maximize the number of funded sites in a given year, while ensuring that there is a balance between sites in the North and urban sites across Canada. The list of priority sites is expected to change in future years as remediation/risk management progresses, newly assessed sites are considered, and remediation/risk management plans are fine-tuned.

Program Resources

A total of \$75 million in funding for 2003-04 and \$100 million in funding for 2004-2005 was announced in the 2003 federal budget for accelerated action on federal contaminated sites. The funding breakdown is shown in Figure 2.

Figure 2: Proposed FCSAAP Expenditures by Program Element

	Fiscal Year	
	2003-2004	2004-2005
Assessment projects	\$3.4M	\$4.48M
Care and maintenance and remediation/risk management projects	\$64.7M	\$85.12M
Project total	\$68.1M	\$89.6M
Program Administration/ Expert Support	\$6.9M	\$10.4M
FCSAAP Total	\$75M	\$100M

Since the federal budget announcement in 2003, additional funding of \$100 million per year has been approved for the next three fiscal years, ending in March 2008. The funds will be allocated in the same way that funding was allocated for 2004-2005 (i.e., \$89.6 million is identified for assessment, care and maintenance and long-term management or remediation of federal contaminated sites, and the remaining \$10.4 million for program management and administration, including the provision of expert support in the areas of human health and ecological risk assessment).

⁴ The Canadian Council of Ministers of the Environment (CCME) provides the principal forum among governments in Canada for the joint development of environmental policies and technical guidance for environmental management. The National Classification System (NCS) is a screening tool for the evaluation of contaminated sites according to their current or potential adverse impacts on human health and the environment. Sites are classified as:

- Class 1 – Action Required
- Class 2 – Action Likely Required
- Class 3 – Action May Be Required
- Class N – Action Not Likely Required
- Class I – Insufficient Data

In order to provide federal custodians with more flexibility in the management of their contaminated sites' programs, the FCSAAP Program Structure was amended for 2004-2005 to allow federal custodians to internally reallocate FCSAAP funds in-year, among care and maintenance and remediation/risk management projects or from assessment projects to care and maintenance or remediation/risk management projects. Federal custodians may reallocate the larger amount of up to five percent or \$100,000 of their FCSAAP funds between care and maintenance and remediation/risk management projects, and up to 25 percent of assessment funding. This additional flexibility allowed custodians to respond to unforeseen circumstances within a fiscal year, while continuing to make progress and meet the requirements of the FCSAAP Program.

2.0 2004-2005 Program Achievements – FCSAAP Priority Sites

Three types of projects are funded under the FCSAAP Program: assessment, care and maintenance, and remediation/risk-management. It should be noted that care and maintenance projects are treated under the same envelope as remediation projects because project selection is based on health and environmental risks/impacts for both categories. Care and maintenance activities are short-term measures to prevent the spread of contamination when immediate action is required. This allows for the study and evaluation to determine the best options for the remediation of the site. In FCSAAP, care and maintenance activities are only undertaken on a limited number of large projects with extensive contamination, such as the abandoned mines in the North.

In 2004-2005, 14 federal custodians undertook 9 care and maintenance projects, 47 remediation/risk management projects and 369 assessment projects. The table below outlines the number of assessment, care and maintenance and remediation/risk management projects and the total FCSAAP expenditures for each federal custodian.

Figure 3: Actual FCSAAP Expenditures by Federal Custodian

Custodian	Assessment		Care and Maintenance		Remediation / Risk Management	
	Number of Projects	FCSAAP funds spent	Number of Projects	FCSAAP funds spent	Number of Projects	FCSAAP funds spent
Agriculture and Agri-Food Canada	10	230,475	--	--	--	--
Canada Border Services Agency	4	36,203	--	--	--	--
Canadian Food Inspection Agency	10	100,450	--	--	--	--
Correctional Service Canada	4	179,634	--	--	--	--
Environment Canada	10	802,463	--	--	1	512,504
Fisheries and Oceans	237	980,593	--	--	21	242,200
Health Canada	--	--	--	--	3	1,636,772
Indian and Northern Affairs Canada (Indian and Inuit Affairs Program)	--	--	--	--	2	2,624,767
Indian and Northern Affairs Canada (Northern Program)	11	194,934	9	34,716,777	4	10,420,073
National Defence	2	385,613	--	--	12	22,710,650
Natural Resources Canada	2	100,186	--	--	--	--
Parks Canada Agency	14	284,830	--	--	2	579,064
Royal Canadian Mounted Police	51	386,826	--	--	--	--
Transport Canada	14	483,987	--	--	2	6,551,509
Total	369	4,166,194	9	34,716,777	47	45,277,539

2.1 Achievements at FCSAAP Care and Maintenance and Remediation/ Risk Management Projects

Over the course of 2004-2005 FCSAAP funded 40 new and 16 previously approved federal contaminated site projects where activities were undertaken to reduce the risk to human health and the environment. Information on the work accomplished at each of the 56 priority sites is provided in Appendix 1: Reports on Progress at Individual FCSAAP Sites.

Progress in managing these highest-risk sites is tracked according to the ten steps of the CSMWG *Federal Approach to Contaminated Sites* (see box at right).

Figure 4 (following page) illustrates, using the Ten-Step Process, the progress made at each FCSAAP-funded project over the two years (2003-04 and 2004-2005). As shown in Figure 4, occasionally projects can experience an apparent "regression" in the step that is reported at fiscal year end. This is because on large, complex projects remediation and assessment work is often done simultaneously. New information obtained from assessment work can cause the project manager to revise the level of progress achieved on a site as new contaminants are discovered or the extent of the contamination is found to be larger in scope than previously identified. As well, decisions are sometimes made to revamp or enhance a remediation project. The end result is that more work is required than previously planned, and consequently the last step completed or in progress at fiscal year end may be revised to reflect this change in scope.

Federal Approach for Addressing Contaminated Sites -Ten-Step Process

Step 1 – *Identify Suspect Sites*: Identifies potentially contaminated sites based on activities (past or current) on or near the site.

Step 2 – *Historical Review*: Assembles and reviews all historical information pertaining to the site.

Step 3 – *Initial Testing Program*: Provides a preliminary characterization of contamination and site conditions.

Step 4 – *Classify Contaminated Site Using the CCME National Classification System*: Prioritizes the site for future investigations and/or remediation/risk-management actions.

Step 5 – *Detailed Testing Program*: Focuses on specific areas of concern identified in Step 3 and provides further in-depth investigations and analysis.

Step 6 – *Reclassify the Site Using CCME National Classification System*: Updates the ranking based on the results of the detailed investigations.

Step 7 – *Develop Remediation/Risk Management Strategy*: Develops a site-specific plan to address contamination issues.

Step 8 – *Implement Remediation/Risk Management Strategy*: Implements the site-specific plan that addresses contamination issues.

Step 9 – *Confirmatory Sampling and Final Reporting*: Verifies and documents the success of the remediation/risk-management strategy.

Step 10 – *Long-Term Monitoring*: If required, ensures remediation and long-term risk-management goals are achieved.

Source: A Federal Approach to Contaminated Sites, 1999.

Note: The Steps indicate the stage a site is at, and not the effort associated with each Step. Much more time and energy is required to complete Step 8 than any other step.

Figure 4: Progress at FCSAAP-funded Projects 2004-2005

Steps in the Ten-Step Process (from the Federal Approach to Contaminated Sites)													
Federal Custodian	Project	1	2	3	4	5	6	7	8	9	10	FCSAAP Funds spent on Project during FY 04-05(\$)	Expenditure since program initiation (\$)
Care and Maintenance													
INAC-NAP	Faro Mine											10,677,518	20,525,376
INAC-NAP	Giant Mine											6,787,402	12,575,246
INAC-NAP	Colomac Mine											8,331,100	18,831,100
INAC-NAP	Mount Nansen Mine											932,180	1,599,342
INAC-NAP	Silver Bear Mines											791,239	791,239
INAC-NAP	Tundra-Taurcanis Mine											1,207,804	1,207,804
INAC-NAP	Clinton Creek Mine											799,958	1,404,223
INAC-NAP	United Keno Hill Mine											2,636,530	3,991,316
INAC-NAP	Discovery Mine											2,553,046	2,553,046

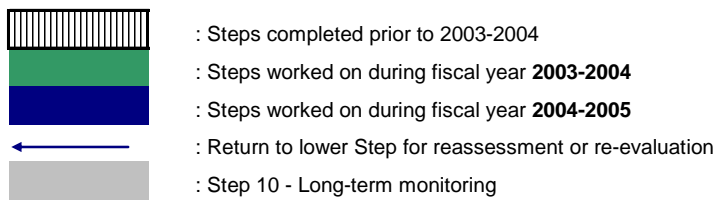


Figure 4 Continued

Steps in the Ten-Step Process (from the Federal Approach to Contaminated Sites)													
Federal Custodian	Project	1	2	3	4	5	6	7	8	9	10	FCSAAP Funds spent on Project during FY 04-05(\$)	Expenditure since program initiation (\$)
Remediation/ Risk - Management Projects													
INAC-NAP	Resolution Island											7,154,394	16,091,094
INAC-NAP	CAM F- Sarcpa Lake											912,229	912,229
INAC-NAP	FOX C - Ekalugad Fiord											1,051,861	1,051,861
INAC-NAP	Port Radium Mine											1,301,589	1,301,589
INAC-IIABL	Oxford House											551,880	551,880
INAC-IIABL	Barren Lands											2,072,887	2,072,887
DND	Valcartier											1,520,400	1,969,400
DND	Saglek											5,495,000	17,563,000
DND	Harvey Barracks											1,971,511	8,276,249
DND	14 Wing Greenwood											558,259	558,259
DND	Fox-M											3,474,404	6,863,404
DND	PIN 4											47,597	1,650,597
DND	DYE-M											4,189,678	4,189,678

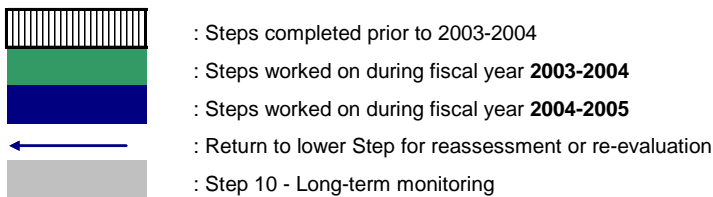


Figure 4 Continued

Steps in the Ten-Step Process (from the Federal Approach to Contaminated Sites)													
Federal Custodian	Project	1	2	3	4	5	6	7	8	9	10	FCSAAP Funds spent on Project during FY 04-05(\$)	Expenditure since program initiation (\$)
Remediation/ Risk - Management Projects													
DND	Colwood											1,222,798	1,222,798
DND	Suffield											500,868	564,868
DND	Goose Bay - Upper Tank Farm											358,337	358,337
DND	Goose Bay - Survival Tank Farm											128,412	128,412
DND	CAM-2											3,243,387	3,243,387
TC	Rock Bay											4,451,509	4,451,509
TC	Former Radar Site 59											2,100,000	2,100,000
EC	Pacific Enviro Centre											512,504	1,521,888
HC	Weagamow Lake											942,992	1,252,509
HC	Kasabonika											448,980	448,980
HC	Lansdowne House											244,800	244,800

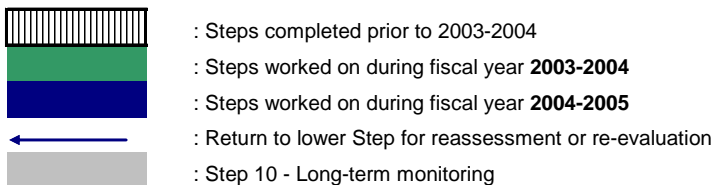


Figure 4 Continued

Steps in the Ten-Step Process (from the Federal Approach to Contaminated Sites)													
Federal Custodian	Project	1	2	3	4	5	6	7	8	9	10	FCSAAP Funds spent on Project during FY 04-05(\$)	Expenditure since program initiation (\$)
Remediation/ Risk - Management Projects													
DFO	Belleville											175,000	216,415
DFO	20 Lightstations											67,200	67,200
PCA	Banff National Park											554,064	554,064
PCA	Glacier National Park											25,000	25,000

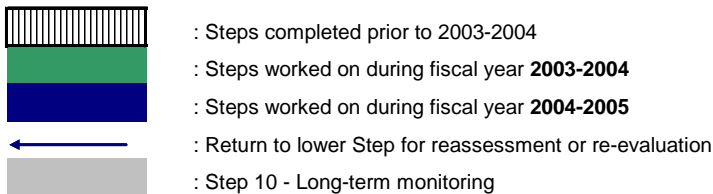
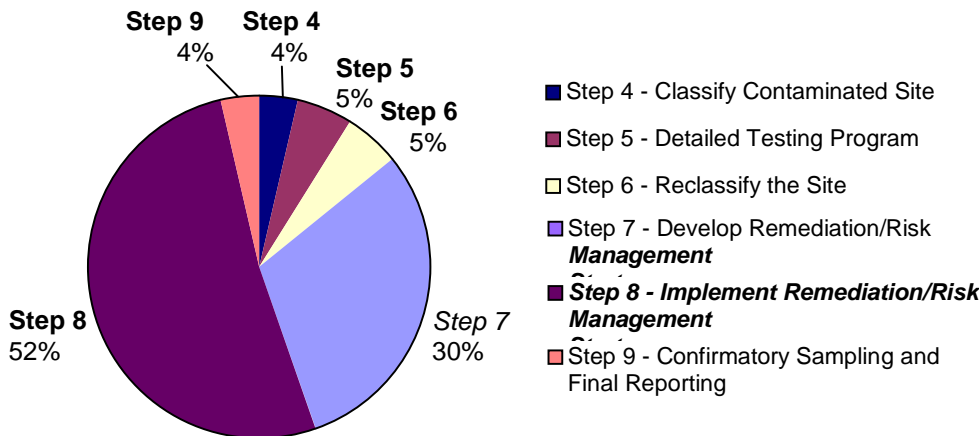


Figure 5 provides an overall picture of the last step in which work was undertaken as a percentage of the total number of FCSAAP projects that received remediation/risk management and care and maintenance funding in 2004-2005. Approximately half (52 percent) of all projects are in Step 8 of the CSMWG Federal Approach to Contaminated Sites (refer to the box on page 11 for more information about the Ten-Step Process). The majority of the projects that are in Step 8 are DFO lightstations.

Figure 5: Status of FCSAAP Care and Maintenance and Remediation/ Risk Management Projects by Step



2.2 Location of FCSAAP Care and Maintenance and Remediation/ Risk Management Projects

The FCSAAP Program supports federal custodian departments and agencies in addressing contaminated sites in all parts of Canada. The provincial/territorial distribution of the care and maintenance and remediation/risk management projects where work was undertaken in the first two years of the program (2003-04 and 2004-2005) is shown in the map on the following page (Figure 6). The relatively large concentration of remediation/risk management projects in British Columbia is due to the work being done by DFO. In 2004-2005 DFO worked on 20 projects in British Columbia as part of its large-scale remediation program for lightstations.

As demonstrated in the map, the three major participants over the first two years of the program were DFO (21 projects), Indian and Northern Affairs Canada (16 projects), and the Department of National Defence (13 projects). However, it should be noted that DFO has a larger number of small remediation/risk management projects. Although Indian and Northern Affairs Canada and the Department of National Defence have fewer projects, many are large scale (i.e., over \$1 million) and, in total, account for approximately 88 percent of total FCSAAP expenditures by custodians on care and maintenance and remediation/risk management projects. Please refer to Appendix 6 for detailed financial information.

Figure 6: Priority FCSAAP projects where work was undertaken in 2003-04 and 2004-2005



The table below shows the distribution of care and maintenance and remediation/risk management projects by province and territory. British Columbia has the largest number of projects. Approximately 70 percent of the funding is spent on Department of National Defence and Indian and Northern Affairs Canada projects in the North (Northwest Territories, Yukon and Nunavut).

Figure 7: Distribution of Care and Maintenance and Remediation/Risk Management Projects by Province and Territory

Province / Territory	Number of Projects	FCSAAP funds spent
British Columbia	24	6,279,011
Alberta	3	3,026,443
Manitoba	2	2,624,767
Ontario	4	1,811,772
Quebec	1	1,520,400
Nova Scotia	1	558,258
Newfoundland	4	8,081,749
Northwest Territories	6	20,972,180
Yukon	4	15,046,186
Nunavut	7	20,073,550
Total	56	79,994,316

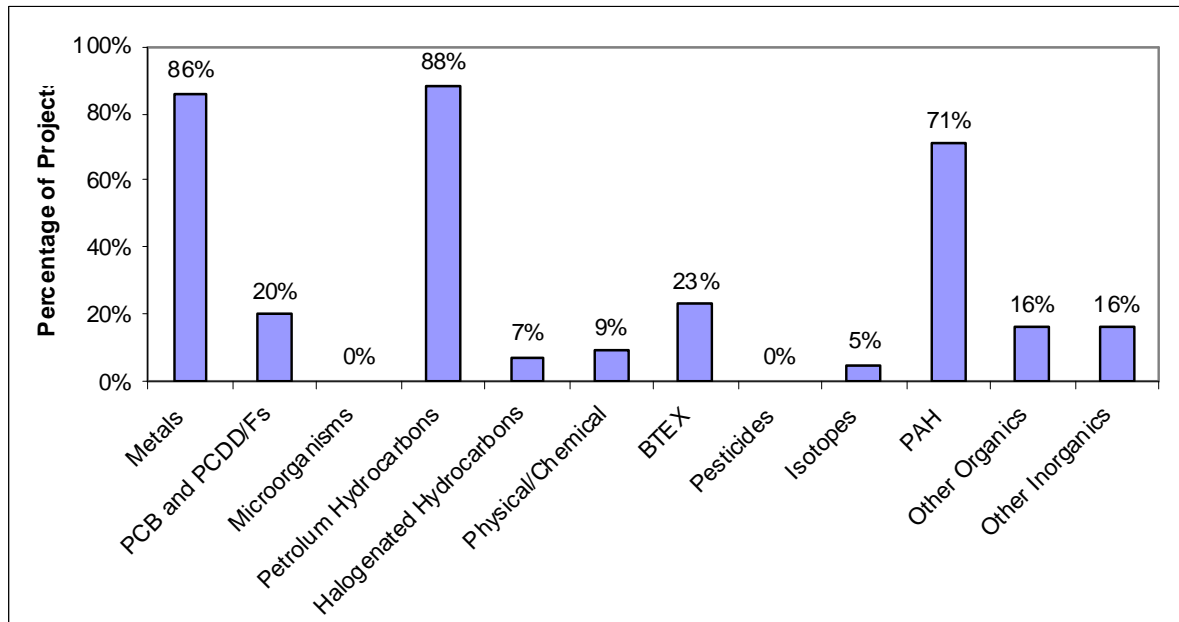
2.3 Nature of Contamination at FCSAAP Funded Care and Maintenance and Remediation/ Risk Management Projects

A contaminated site is an area in which substances occur at concentrations above normally occurring background levels and pose, or are likely to pose, an immediate or long-term hazard to human health or the environment. Determining the risk posed by the presence of a contaminated site involves identifying the contaminants of concern, identifying potential receptors, determining potential exposure pathways and estimating the level of risk based on the pathways. Appendix 5 provides more information on how human health and ecological risks are evaluated for a federal contaminated site.

The sites targeted for FCSAAP funding in 2004-2005 are contaminated with a wide variety of substances. The contamination is most often due to the presence of petroleum hydrocarbons (88 percent), metals (86 percent), and polycyclic aromatic hydrocarbons (PAHs) (71 percent). This contamination was most commonly found in surface soils (84 percent) and groundwater (41 percent). The high percentage of sites contaminated with petroleum hydrocarbons in surface soil is consistent with our experience that a significant proportion of the contaminated sites are the result of leaking fuel storage tanks. Federal custodians are not only taking steps to remediate these contaminated sites, they are taking measures to help reduce the risk that this type of contamination will occur in the future. The graphs in this section were constructed using the contamination information provided by custodians at year-end. It should be noted that a given site may have more than one type of contaminated media and more than one type of contaminant, therefore, the percentages found in the graphs below do not add up to 100 percent.

Figure 8 depicts the distribution of each type of contaminant across the projects.

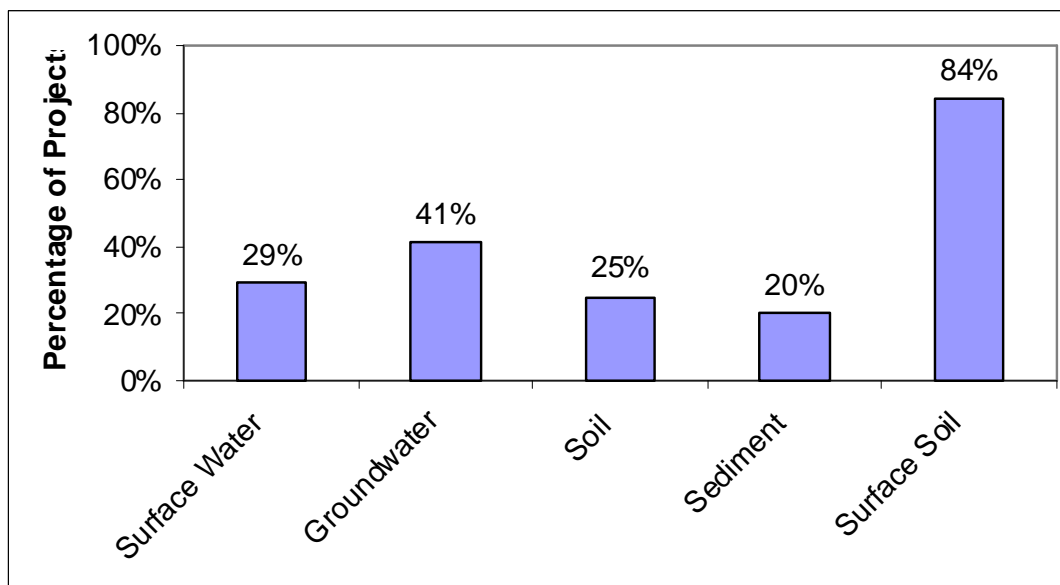
Figure 8: Types of Contamination on Remediation/Risk Management and Care and Maintenance sites



Note: The Physical/Chemical category includes such factors as temperature, pH, turbidity, and total dissolved solids.

Figure 9 shows where the contamination was found for each of the projects. This information is important because the environmental quality guidelines for each contaminant may be different depending on whether the contaminant was found in surface water, groundwater, soil or sediment. Environmental quality guidelines are intended to protect, sustain, and enhance the quality of the environment. The guidelines are defined as numerical concentrations or narrative statements that are recommended as levels that should result in negligible risk to living organisms, their functions, or any interactions that are integral to sustaining the health of ecosystems.

Figure 9: Contaminated Media on Remediation/Risk Management and Care and Maintenance sites



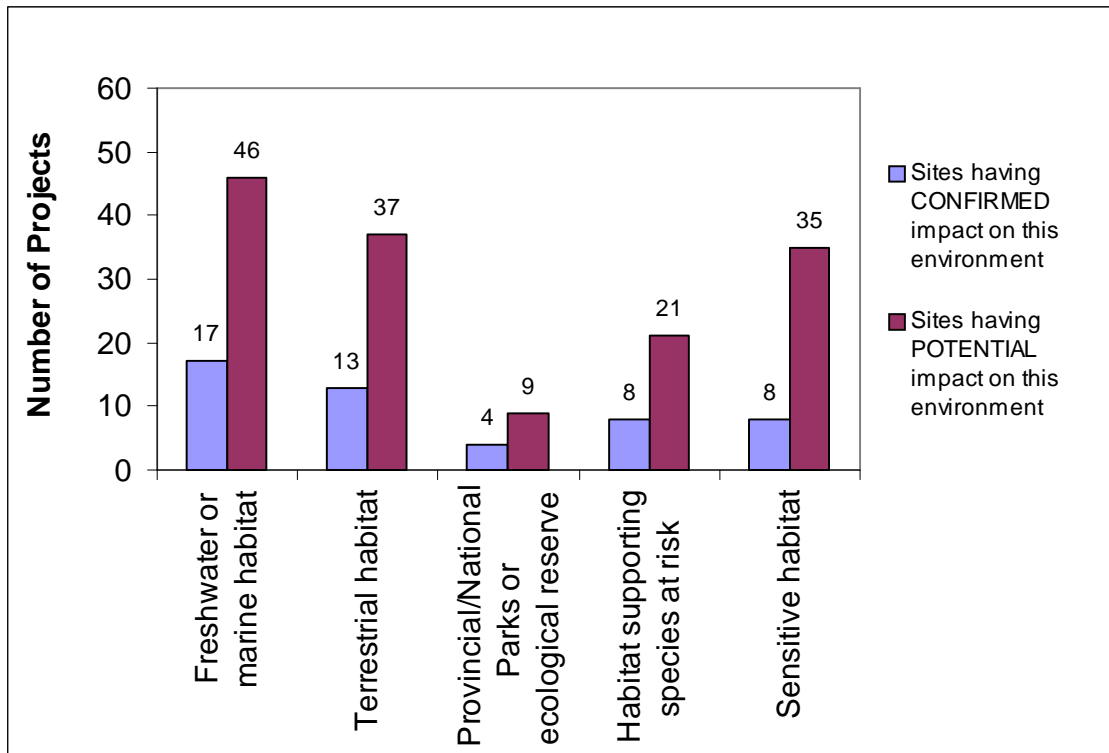
The environmental impact of the contamination at each site was measured in terms of the risk it posed to the ecology. The most common type of confirmed contaminated site ecological impact was to freshwater or marine ecology (17 out of 56 projects, or 30 percent), as shown in Figure 10.

Specific habitats for plants and wildlife were categorized into five environments:

1. Freshwater or marine habitat;
2. Terrestrial habitat;
3. Provincial/National parks or ecological reserve;
4. Habitat supporting species at risk;
5. Sensitive habitat.

The Ecological Risk Evaluation process determines the effect that each individual project has on a habitat. The results of the 2004-2005 data analysis are consistent with the results shown in 2003-2004, as the potential threat to the marine ecology was found to be the most common condition across all the projects, although this result is not as remarkable in the 2004-2005 data analysis due to the larger sample size (56 projects in 2004-2005 versus 18 projects in 2003-2004).

Figure 10: Confirmed or Potential Ecological Impact on the Environment



Note: A confirmed or potential ecological impact on a sensitive habitat is one that may impact wildlife, aquatic life, vegetation or migratory species (including breeding or spawning areas) and areas of high biodiversity (reference: Ecological Risk Evaluation (ERE) Level 1 Worksheet).

2.4 FCSAAP Program Priority Sites

2.4.1 FCSAAP Program Funding Approvals and Expenditures

Figure 11 illustrates the number of projects that were approved for FCSAAP funding and a summary of the actual FCSAAP fund and departmental expenditures, demonstrating that 70/30 and 90/10 funding agreements were upheld or surpassed.

Figure 11: Summary of Project Funding Approvals and Actual Expenditures for 2004-2005

Project Type	FCSAAP Funding Allocated	Project Work Completed Fiscal Year 2004-2005				
		Number of Projects	FCSAAP Fund Expenditures	Percent of Total Expenditure	Departmental Expenditures	Percent of Total Expenditure
Care and Maintenance	\$34.89M	9	\$34.72M	73	\$12.87M	27
Remediation	\$50.23M	47	\$45.28M	70	\$19.38M	30
Assessment	\$4.48M	369	\$4.16M	57	\$3.16M	43
TOTAL	\$89.60M	425	\$84.16M		\$35.41M	

2.4.2 Assessment Projects

In addition to conducting care and maintenance and remediation activities at 56 priority sites, FCSAAP funding was spent on 369 assessment projects. In some cases, an assessment project is composed of more than one site. For example, in 2004-2005 DFO undertook 237 assessment projects, which corresponds to 295 site assessments. FCSAAP funds are allocated annually, and there is no provision for multi-year assessment funding.

Projects that receive assessment funding from FCSAAP are undergoing Steps 1-6 of the *Ten-Step Process*. Funding of assessment projects is an important part of the FCSAAP Program, as it involves a detailed identification and analysis of the nature and extent of contamination. This helps determine the risks to human health and the environment, and thereby to obtain a more accurate estimate of the level of financial liability.

Figure 12a provides a breakdown of the assessment projects that were carried out in each province or territory. British Columbia was the province where the highest number of assessment projects were carried out (122 projects) in 2004-2005 and this was in large part due to the 102 assessment projects undertaken in this province by DFO. Figure 12b provides a breakdown of the number of assessment projects by federal custodian. DFO conducted the most assessments in 2004-2005.

Figure 12a: Number of assessment projects by province/territory

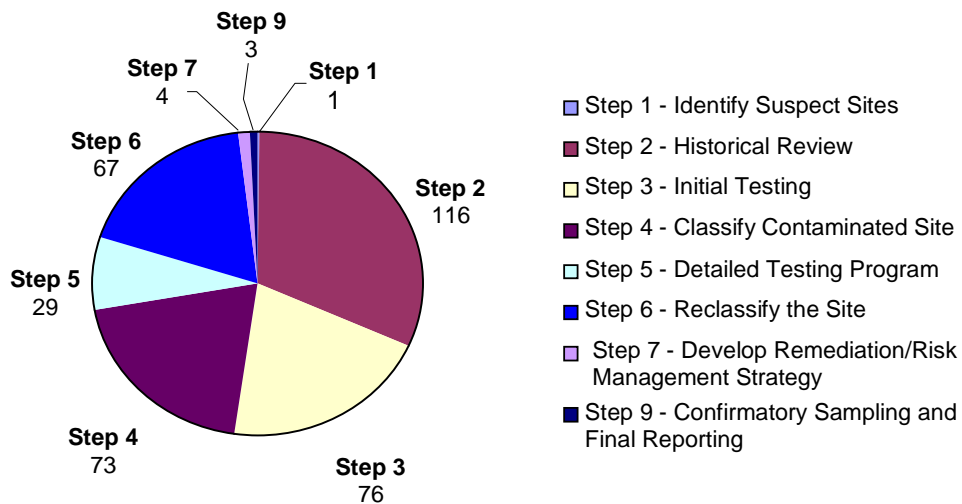
Province / Territory	Number of Projects	FCSAAP Funds Spent
British Columbia	122	990,761
Alberta	18	371,367
Saskatchewan	8	72,990
Manitoba	14	280,192
Ontario	21	469,163
Quebec	75	713,540
New Brunswick	10	37,194
Nova Scotia	36	249,199
Prince Edward Island	7	37,465
Newfoundland	33	485,736
Northwest Territories	10	111,651
Yukon	3	82,220
Nunavut	12	264,716

Figure 12b: Number of assessment projects by federal custodian

Federal Custodian	Number of Projects	FCSAAP Funds Spent
Agriculture and Agri-Food Canada	10	230,475
Canada Border Services Agency	4	36,203
Canadian Food Inspection Agency	10	100,450
Correctional Services Canada	4	179,634
Fisheries and Oceans Canada	237	980,593
Department of National Defence	2	385,613
Environment Canada	10	802,463
INAC* (Northern Affairs Program)	11	194,934
Natural Resources Canada	2	100,186
Parks Canada Agency	14	284,830
Royal Canadian Mounted Police	51	386,826
Transport Canada	14	483,987
*INAC = Indian and Northern Affairs Canada		

Figure 13 provides an overall picture of the last step in which work was undertaken for FCSAAP assessment projects that received funding in 2004-2005. Just over a quarter (31 percent) of assessment projects are in Step 2 of the CSMWG Federal Approach to Contaminated Sites (refer to the box on page 11 for more information about the Ten-Step Process). Occasionally the last step reported for an assessment project is beyond Step 6, the normal end point for the funding of an assessment project. This can occur when it is determined that additional assessment work is required on a complex project before remediation work begins. As well, in very specific circumstances it is more efficient to carry out assessment and remediation work within a very short timeframe. This approach is appropriate for projects like Environment Canada's Hydrometric Stations, where it is more cost effective to assess and remediate the limited contamination on these sites in a short timeframe (refer to the Hydrometric Station box, page 23, for more information). However, the majority of assessment projects that require further work apply for remediation/risk management funding in future years if they meet the eligibility requirements of the FCSAAP program.

Figure 13: Status of FCSAAP Assessment Projects by Step



Environment Canada: Assessment of Hydrometric Stations

Environment Canada, in cooperation with the provinces and INAC, operates or has operated 1308 hydrometric stations that have been identified as having used instrumentation containing elemental mercury. The instrumentation at all of these locations has been replaced or removed. Beginning in 1997, Phase II assessments of a representative sample of these sites indicated that there is potential contamination from possible spills of elemental mercury at these locations. To date, approximately 886 of these sites have been assessed and remediated where required. It is planned that the remaining 422 sites will be completed by the end of fiscal year 2008-2009.

Future work is also planned for assessing 367 hydrometric sites that are or have used wood stilling wells that were treated with creosote. As a follow-up to Phase I work completed in 1998, Phase II assessments are required to determine what steps may be required to deal with this issue.

A total of \$4,480,000 was approved for site assessment expenditures in 2004-2005, and one custodian (Royal Canadian Mounted Police) also had access to FCSAAP funds that were transferred from fiscal year 2003-2004 to 2004-2005, in the amount of \$105,422. As shown in Figure 11 (page 20), over the course of the year federal custodians contributed funds amounting to \$3,159,367 and utilized \$4,166,194 of FCSAAP funding. As indicated in the financial table in Appendix 6b, the difference between planned and actual expenditures for assessment projects was \$394,728, after adjusting for the funds transferred from the previous fiscal year (\$105,422), and for the funds that were returned to the FCSAAP program (\$24,500). The variance is due to two factors:

1. Custodians who received funds and could not complete the assessment work in this funding year rescheduled the work for the next season, transferring unspent FCSAAP funds in the amount of \$238,507 to fiscal year 2005-2006⁵.
2. FCSAAP funds in the amount of \$156,220 were not spent (details can be found in Appendix 6: Expenditure Tables).

Variance between planned and actual expenditures for assessments can be attributed to a variety of factors including the reallocation of funding from previously approved sites to address a more urgent assessment requirement, shifting departmental demands or priorities and the difficulty in initial estimation of the projected costs of assessments as the nature and extent of contamination is unknown at the outset of the project.

⁵Assessment funding to be transferred to 2005-2006 as follows: RCMP: \$32,021; Parks Canada: \$18,620, and; Correctional Services Canada: \$187,866.

The Secretariat has identified a number of gaps in the reporting of assessment projects. The information gaps include inconsistent reporting of: site classification, Federal Contaminated Sites Inventory number, and results of assessment. These issues will be resolved for future reporting exercises.

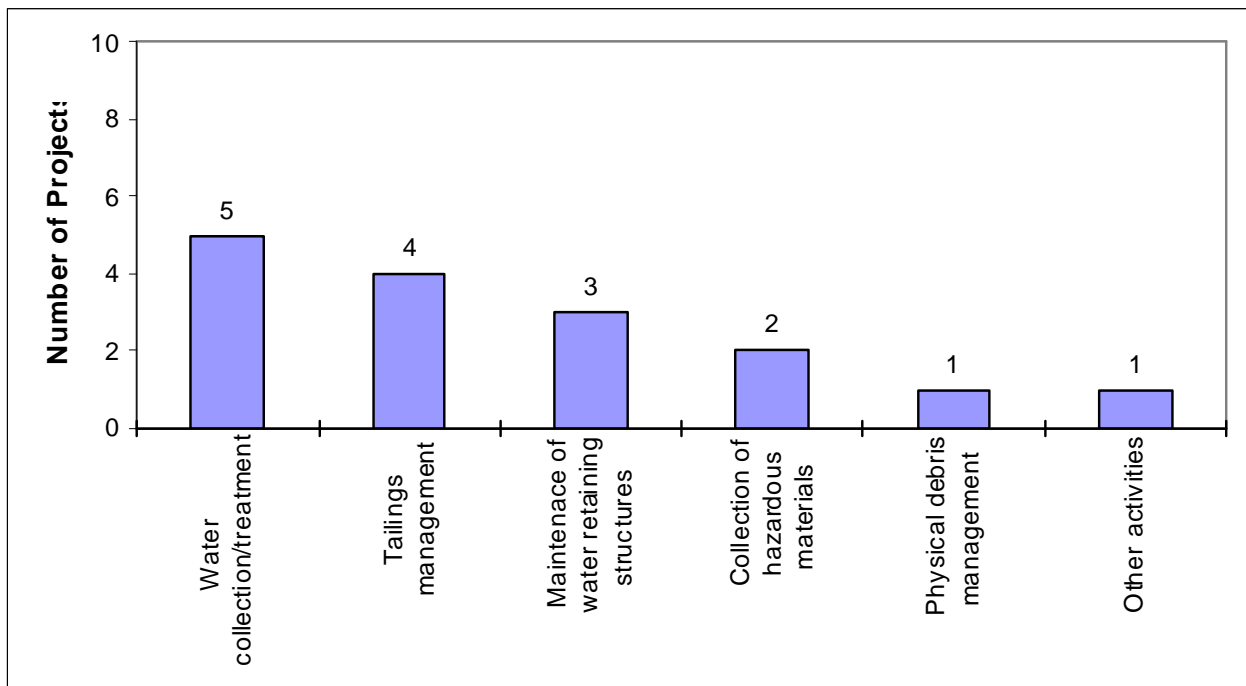
2.4.3 Care and Maintenance Projects

Care and maintenance activities are undertaken when there is an imminent danger to human health and/or the environment, and this approach is required on a small number of larger projects. Short-term care and maintenance measures are implemented to stop the spread of contamination when immediate action is necessary. This allows remediation options to be fully developed and studied. These activities typically occur at abandoned or idle mines, or on other sites where there is extensive contamination.

Federal custodians use various methods and approaches depending on the project and the nature of the risks that are present. They manage health and environmental concerns and maintain the necessary infrastructure, such as retaining structures and other risk-management measures used to collect and treat water. Other examples of the activities that may be undertaken include monitoring the site, posting warnings, restricting access to the site, changing land-use patterns at or around the site, isolating contaminants or pollutants by stabilizing them, erecting barrier walls, capping the site, and partial remediation. It should be noted that the categories of remediation/risk management and care and maintenance are not mutually exclusive – some of the activities that are classified as care and maintenance can be undertaken on a remediation/risk management project, and vice versa.

In 2004-2005, nine care and maintenance projects were funded under the FCSAAP Program. Many of these projects are abandoned/idle mines in the North that are now the responsibility of Indian and Northern Affairs Canada (INAC). When private owners relinquished their properties according to the legislation of the day, or when companies went bankrupt, many of these sites became the responsibility of the Government of Canada, under the custodianship of INAC. Figure 14 shows the breakdown of care and maintenance activities that occurred on FCSAAP-funded care and maintenance projects in 2004-2005. At some sites more than one type of care and maintenance activity was undertaken.

Figure 14: Care and Maintenance Activities



Note: Other activities include vibration and air quality monitoring and the geotechnical inspection of dams.

Indian and Northern Affairs: Care and Maintenance at Faro Mine

The Faro Mine complex is located in central Yukon, approximately 200 km north-northeast of Whitehorse. From 1969 to 1998, Faro Mine was the largest zinc/lead mining operation in Canada. The mine complex can be reached by road from the town of Faro, which is located approximately 25 km to the south. The mine has not operated since the company ceased operations in late 1998. The federal and territorial governments have attempted, without success, to sell the property or find a private industry operator. In 2003, it was determined that the property was not economically viable. This allowed closure planning to proceed for final, permanent closure of the site, and a comprehensive abandonment plan is expected to be completed by 2006. Currently a court appointed Interim Receiver (appointed April 1998 with funding provided by INAC) is overseeing the ongoing care and maintenance programs at the mine site.

Today, the site consists of waste rock dumps, ore processing facilities, water treatment plants, tailings disposal facilities, and various other buildings. A large tailings impoundment holds an estimated 54 million tonnes of zinc-contaminated tailings, and three large open pits hold water containing high levels of metals. The surface water found in the tailings zone is contaminated and requires treatment prior to release to the environment.

In 2004-2005, care and maintenance activities at the site included infrastructure maintenance and repair, and continued assessment of the groundwater below the tailings impoundment. Additional site assessments and engineering studies were undertaken to investigate alternatives for remediation. Health and safety hazards being managed at the mine site included dilapidated buildings, open excavations and potential lead exposure. The mine has also influenced the traditional use of the Faro area by the Ross River Dena, a Yukon First Nation group, which has raised concerns over the impact the mine operations and tailings have had on wildlife.

In 2004-2005 \$34,890,950 was approved for care and maintenance projects. As shown in Figure 11, over the course of the year federal custodians contributed funds amounting to \$12,864,925 and utilized \$34,716,777 of the FCSAAP funding. The difference between allocated FCSAAP funding

and actual expenditures is \$174,173. This variance was spent on remediation/risk management projects (details can be found in Appendix 6: Expenditure Tables).

2.4.4 Remediation / Risk Management Projects

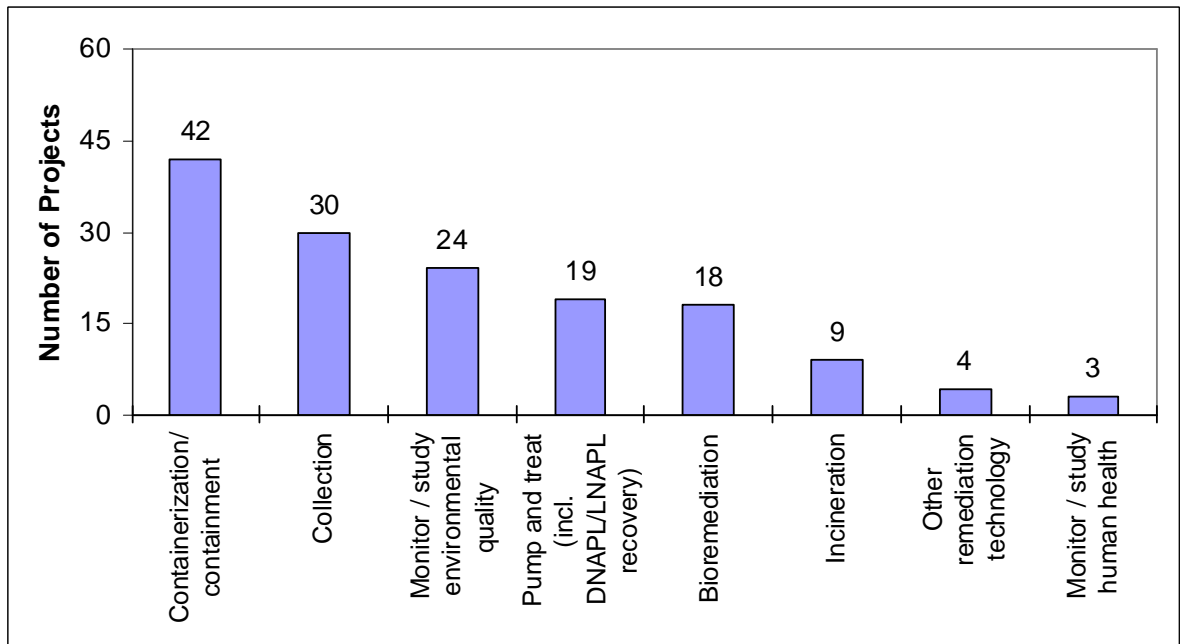
After completing the site assessment, federal custodians prepare remediation/risk management action plans. Federal custodians oversee the development of the plan while working closely with various experts (e.g., consultants, contractors, and trades people) that are hired to design and implement the action plan. The plan identifies the various options available after considering the unique conditions on the site in question, and ultimately recommends the preferred method to reduce the risk to human health and the environment. Common remediation activities reduce exposure to various contaminants by removing, destroying or containing them.

Public consultation and information sharing, especially with communities in close proximity to sites where work will be done play an important role in planning and implementing remediation projects. Custodians share information with surrounding communities by holding public information sessions, workshops, and other communication activities.

Figure 15 shows the breakdown of remediation/risk-management activities that were undertaken on FCSAAP projects in 2004-2005. This work is done as part of Step 8, of the *Ten-Step Process*. Step 8 is composed of many different types of activities ranging from obtaining permits and selecting a contractor to incineration and the development of an environmental quality-monitoring program. It encompasses care and maintenance, remediation and risk management activities. Due to the large number and wide variety of tasks that can be undertaken, it could be years before a project is ready to move beyond Step 8. Sites that have moved through Step 9 in the *Ten Step Process* are considered “remediated”, and, when deemed necessary, long-term monitoring is implemented.

Figure 15 focuses on the major remediation activities that were undertaken in 2004-2005, which included containerization/containment (75 percent of projects) and collection of contaminants (54 percent of projects). Risk management activities also make up a significant portion of the work done in Step 8. Risk management involves the selection and implementation of a strategy to control risk, followed by monitoring and evaluation of the effectiveness of that strategy. Figure 15 demonstrates that 43 percent of projects (24 projects) monitored/studied environmental quality.

Figure 15: Remediation / Risk Management Activities Undertaken on Care and Maintenance and Remediation / Risk Management Projects



One of the more innovative remediation technologies used on federal contaminated sites is bioremediation because it actually cleans the site, whereas common industry-wide practice often involves the collection or containerization of contaminants. Bioremediation occurs through the process of biodegradation, a process which uses microorganisms (e.g., bacteria and fungi) to break down organic compounds and convert them to biomass, intermediate products, and by-products such as carbon dioxide (CO₂), methane (CH₄), and inorganic salts.⁶ Bioremediation is usually chosen because it is a cost effective technology and contaminants are converted in situ. However, it takes a long time for the process to be completed, and it can only be used for certain types of contaminants. The biodegradation process must be monitored to ensure optimal conditions. Five of the seven custodians that undertook remediation/risk-management activities used bioremediation technology on some of their projects. Health Canada used this type of remediation technology on two out of their three projects. The Department of National Defence had the largest overall number of projects using bioremediation technology, with a total of six projects.

⁶ Contaminated Sites Management Working Group (CSMWG) Publication: "Site Remediation Technologies: A Reference Manual", Chapter 2, section 2.3.2

Parks Canada: Remediation at Banff National Park – Cougar Street

This site is located in a Banff municipality residential neighbourhood and was contaminated with arsenic, barium, chromium, copper, lead, mercury, selenium, tin and zinc. Among those heavy metals, copper, lead and zinc were identified as the main contaminants of concern due to their high concentrations. The contamination is believed to have come from an old dump that was used between 1901 and 1907 to dispose of ash, household refuse, cinders and other debris. Cinders were a source of fill material due to their abundance resulting from coal-fired locomotives and coal-fired furnaces in this area.

Maintaining good communication with the affected local residents and business community was of utmost importance throughout the project. Letters, fact sheets and interviews with affected lessees helped to address their concerns and to raise any special requests. Most of the remediation and land reclamation work was completed over a period of two months between June and August 2004. The remediation work involved excavating approximately 1,600 cubic metres of soil on eight residential properties on Cougar and Marten streets in Banff. Extensive preparatory work was undertaken to facilitate the restoration of the site to its original landscaped condition once the excavation was completed. This included conducting structural building assessments prior to the commencement of site construction activities, additional delineation of areas of concern, taking photographs of the work area, landscape, and built features, as well as surveying the condition of property features, fence lines and any other site yard features (decks, shrubs, etc.) that may be impacted during the completion of the remediation work.

In total, 2,461 tonnes of heavy metal soils were removed, disposed of in a provincially certified landfill, and replaced with clean subsoil and topsoil. The site has now been fully restored to its original pre-construction condition.

The Annual Report Expenditure tables (Appendix 6) provide an overview of FCSAAP expenditures by custodian and project. As with assessment projects, some remediation/risk management projects are composed of more than one site.

As indicated in Figure 11, the total funding approved in 2004-2005 for FCSAAP remediation/risk-management projects was \$50,229,050. Over the course of the year, federal custodians contributed funds amounting to \$19,382,785, and spent \$45,277,539 of FCSAAP funding. The variance between allocated FCSAAP funding and actual expenditures is \$5,072,620. However, given that Transport Canada's Newfoundland Dockyard project was delayed, and that the department did not request the \$2.415M of remediation/risk management money that was allocated, the variance is adjusted to \$2,657,621 (including funds transferred from 2003-2004)⁷.

This variance is due to several factors:

1. Custodians unable to complete the planned work in 2004-2005 rescheduled activities for the next season, transferring FCSAAP funding in the amount of \$618,694 to fiscal year 2005-2006⁸.
2. INAC (Northern Affairs Program) spent \$174,173 of their approved care and maintenance funding on their remediation/risk management projects.
3. FCSAAP funds in the amount of \$2,213,100 were not spent.⁹

More information on the individual project expenditures can be found in Appendix 6: Expenditure Tables.

⁷ Health Canada transferred funds from fiscal year 2003-2004 to 2004-2005 in the amount of \$121,110.

⁸ Remediation/Risk Management funds to be transferred to 2005-2006 as follows: INAC-IIABL: \$288,120; Health Canada: \$304,338; Parks Canada: \$26,236.

⁹ Unspent Funds = (Adjusted Variance – 2003-2004 Transferred Funds) + CM funds used for R/RM

Differences between planned and actual expenditures can be related to a number of factors including:

- Progress on site remediation was greater than originally expected and required additional FCSAAP/departmental funds to complete the work projects that had been initiated in the construction season;
- Change in scope of work;
- Actual costs different from estimates;
- Some activities were postponed to future years;
- Required access to site was not possible due to weather, transportation, or other factors; and
- Litigation or legal issues prevented work from proceeding.

3.0 2004-2005 Program Achievements – Program Management

The first year of the FCSAAP was focused on laying the groundwork for successful program implementation – namely the design of a government-wide strategy and mechanisms to identify and address highest-priority federal contaminated sites. The second year of the program continued to build on these successful first steps, and work was initiated on many more sites. In 2004-2005, funding was provided to perform assessments on approximately 400 sites, and care and maintenance and remediation/risk management activities were undertaken on 56 projects. Program funds were allocated to custodians using a science-based priority setting process that concentrated on the sites posing the highest risk to human health and the environment.

The FCSAAP Program management structure developed in 2003-04 remained unchanged (see Figure 1), and interdepartmental collaboration continued to be a major factor in the success of the program. Further details on the roles and responsibilities of the groups outlined in Figure 1 can be found in Appendix 3: Federal Contaminated Sites Accelerated Action Plan Program Management Structure.

3.1 Key Activities in 2004-2005

3.1.1 FCSAAP Secretariat

Some of the major activities undertaken by the FCSAAP Secretariat in 2004-2005 included:

- developing and enhancing components of the secure website,
- preparing funding approval documents,
- undertaking preliminary work to facilitate the reporting of results,
- coordinating training and workshops,
- developing guidance materials, and
- collaborating with the Contaminated Sites Management Working Group.

Policy related activities undertaken by the Secretariat in 2004-2005 were related to:

- the establishment of a responsive policy framework for contaminated sites for which the responsibility is shared by the federal government and a non-federal entity, and
- activities to prepare for the long-term enhanced program that will begin in 2005-06.

IDEA website

The Interdepartmental Data Exchange Application (IDEA) is a secure website that was developed in 2003-04 and allows custodians to exchange FCSAAP-related information through a single access point. In 2004-2005 further enhancements were made to the website, including:

- continuing development of administrative tools,
- enhancing system stability and security features,
- establishing a reporting module and database,
- configuring a new backup system,
- developing a public document area, and
- improving the administration aspect of various areas of the site.

Guidance documents

The FCSAAP Secretariat developed and improved guidance materials, such as:

- the new site ranking approach for 2004-2005,
- the tools for the performance of ecological risk evaluations (EREs) (update),
- the “FCSAAP Handbook 2004-2008: Overview and Instructions for Submitting Funding Proposals” (January 2004 update),
- guidance for providing advice on contaminated sites,
- guidance on significant engineering failure risk assessment,
- an update on the review of Canadian provincial and federal legislation related to contaminated sites (originally developed in 2002),
- federal guidelines for landfarming of soils contaminated with petroleum hydrocarbons, and
- guidance for accounting for financial liability (TBS).

3.1.2 Expert Support Departments

In 2004-2005 much of the work of Expert Support Departments was focused on the development and delivery of guidance documents and training, the provision of advice and third-party peer review. For example, Environment Canada, in collaboration with other Expert Support Departments, updated the ranking system and ecological risk evaluation procedures and participated in a review of Canadian provincial and federal legislation related to contaminated sites.

DFO produced guidance documents for DFO practitioners and held a DFO National Federal Contaminated Sites Workshop, with contributions from other Expert Support Departments and custodians. Additionally DFO Expert Support staff improved risk assessment tools and refined long-term work planning to improve inter-regional program coordination and information management (i.e., the Program Activities Tracking for Habitat system, or PATH).

Some of the work done by Health Canada included the development, launch and continuous updating of the Health Canada Contaminated Sites Website, which provides guidance materials on the science of risk assessment and a list of completed reports and reviews instigated by Health Canada as part of its Expert Support function. Health Canada developed and published Parts I to IV of its planned series on human health risk assessment guidance for federal contaminated sites in Canada. They provided training to federal, provincial and municipal levels of government on deterministic and probabilistic risk assessment methods. The training was also made available to provincial and municipal agencies due to their interest and responsibility in resolving contaminated sites issues, as there was a desire to establish effective linkages and common understanding of contaminated sites issues between the various jurisdictions.

Each Expert Support Department conducted sites visits. For example, in 2004-2005 DFO travelled to sites in British Columbia and the Arctic to better understand the challenges that are being faced with respect to fish habitat and to communicate FCSAAP processes to regional staff. All three departments provided custodians with advice regarding risk assessments, site classifications, regulations, remedial plans and technical requirements.

Health Canada has the additional responsibility of providing Public Involvement / Public Outreach (PI/PO) guidance and advice to federal custodians. In the fall of 2004, Health Canada began to build its PI/PO team. The small team of specialists initiated an ambitious program to provide guidance, training and advice on PI/PO to federal contaminated site managers. This included the development of an Instructors' Manual and a Participants' Guide to a two-day training course for federal custodians, entitled "Improving Stakeholder Relationships: Public Involvement and Contaminated Sites".

The Expert Support Departments each produce an Annual Report that provides detailed information on the activities that they carried out during the fiscal year. Copies of these documents can be obtained by contacting the Expert Support Department directly, by contacting:

- **DFO** – Expert Support Federal Contaminated Sites, Habitat Program Services Branch, Habitat Management, Oceans Sector, Fisheries and Oceans Canada, 200 Kent Street, Ottawa, ON, K1A 0E6.
- **Environment Canada** - Contaminated Sites Division, Pollution Prevention Directorate, Environment Canada, 70 Crémazie Street Gatineau, Québec K1A 0H3.
- **Health Canada** – on the web at: http://www.hc-sc.gc.ca/ewh-semt/pubs/contamsite/index_e.html, or by contacting Contaminated Sites Division, Bureau of Risk and Impact Assessment, Safe Environments Program, Healthy Environments and Consumer Safety Branch, Health Canada, 269 Laurier Avenue West, Ottawa, ON, K1A 0K9.

4.0 Measuring Performance and Looking Forward

The key achievements of the FCSAAP in its second year of operation included the development and enhancement of program policies and procedures, and further development of guidance material and training for federal custodians. Work was done to address the key program activity objectives of the FCSAAP as identified in the Results-based Management Accountability Framework (RMAF), including reducing the number of high risk sites, reducing human and ecological risks and financial liabilities, and increasing public confidence in the management of federal contaminated sites.

In the second year of the FCSAAP there was an almost three-fold increase in the number of care and maintenance and remediation/risk management projects funded. Of the 18 projects where work was undertaken in 2003-04, 16 projects came forward for further funding in 2004-2005. To date, one remediation/risk management project has been completed. There was also an increase in the number of assessment projects that were undertaken in 2004-2005 (369 assessment projects vs. 125 assessment projects in 2003-04), and a percentage of these projects are expected to move forward for remediation/risk management in future years.

4.1 Federal Contaminated Sites Financial Liability

The funding of assessment work will lead to a more accurate estimate of the federal government's financial liability resulting from contaminated sites, and is an important component of the FCSAAP Program. However, it is likely that continued assessment work will result in an increase in federal liability in the short term due to the identification of additional contaminated sites that will require risk-management/remediation.

The recorded liability for contaminated sites includes the estimate of costs to remediate the site to a level appropriate to the land's current or intended federal use. Costs include any estimated expenses related to the remediation and management of federal sites associated with steps 5 to 10 of the Ten-Step Process for sites identified as a Class 1, Class 2 and in limited cases Class I sites. However, when a custodian intends to perform the remediation itself, the liability may include estimated project management costs.¹⁰ The liability amount **excludes** any expenses associated with determining the existence of contamination (i.e. steps 1 to 4 of the Ten-Step Process), overhead costs and project management costs internal to the custodian. This means that the costs associated with assessment and care and maintenance activities are not included in the liability calculation, as they are undertaken to determine the existence and extent of contamination (assessments), or to mitigate the spread of contamination when the danger to human health or the environment is imminent (care and maintenance).

Each year, financial information is reported to the *Public Accounts of Canada*, including the overall financial liability and contingent liability for federal contaminated sites. A contingent liability is a potential liability that may become an actual liability when more information is known. Contingent liabilities are recorded in the Public Accounts when it is likely that a payment will be made, and the amount of the payment can reasonably be estimated.¹¹

The *2004-2005 Public Accounts* marks the beginning of a change in how environmental liabilities are recorded, as it now identifies the two components that make up the total environmental liability - the liability associated with the decommissioning of Atomic Energy of Canada Limited's nuclear facilities, and other federal contaminated sites liabilities. This was done following the completion of Atomic Energy of Canada Limited's review of its decommissioning plan, and the assumptions underlying the estimation and calculation of the decommissioning of nuclear facilities and waste management provisions.

In 2005, the Government of Canada recorded a decrease in the liability related to contaminated sites. As at March 31, 2005, a liability of \$2,874 million was recorded for approximately 2,200 sites, compared with a liability of \$3,133 million for 2,400 sites in 2004.¹² This decrease is in part due to the expenditures that were made during the fiscal year to reduce liability (i.e., remediation work). It is also, in part, the result of further assessment activities that may have decreased the liability numbers associated with certain sites, and may have transferred amounts from "actual liabilities" to "contingent liabilities".

¹⁰ TBS document: *Guidance on Accounting for Environmental Liabilities*, Section 2: Results of Assessment

¹¹ *Public Accounts of Canada, 2004-2005*; Volume I, Section 11, page 11.17.

¹² *Public Accounts of Canada, 2004-2005*; Volume 1, Section 5, page 5.12, and Section 11, page 11.19.

The Public Accounts show an increase in contingent liabilities in 2005, when compared with the records for 2004. In 2005, contingent liabilities were \$2,440 million, compared with \$1,045 million in 2004. This increase is due to the additional information that was gathered during 2004-2005, which allowed for the estimation of potential liability for certain sites.¹¹

4.2 Conclusion

In its second year of operation, the Federal Contaminated Sites Accelerated Action Plan continued to build on the success achieved in the first year of the program. The groundwork that was laid to create an accountable and sustainable program to address federal contaminated sites was further refined and developed. The increased number of assessments, care and maintenance, and remediation/risk management projects that were undertaken in 2004-2005 demonstrates that custodians are committed to the program.

In the first two years of the program, \$219 million was spent (representing approximately \$144 million of FCSAAP funds and \$75 million of custodian funds) on the care and maintenance and remediation/risk management activities on 58 highest-risk projects. In addition, in the first two years a total \$12 million was spent on assessment projects, including \$7 million in FCSAAP funding, and a custodian contribution of \$5 million.

The work to date and lessons learned will influence the design of the new longer-term program made possible by the 2004 federal budget announcement. The \$3.5 billion announced to fund a major multi-year cleanup of contamination on federal lands will allow federal custodians to perform care and maintenance and remediation/risk management work on a broader spectrum of highest risk sites. These will now also include eligible sites classified as "action is likely required" (NCS Class 2). As well, starting in 2005-06 consolidated Crown corporations will be able to participate in the enhanced program.

¹⁰ TBS document: *Guidance on Accounting for Environmental Liabilities*, Section 2: Results of Assessment

Appendices

1. Reports on Progress at Individual FCSAAP Sites
2. Federal Contaminated Sites Management Framework
3. FCSAAP Program Management Structure
4. FCSAAP Project Eligibility, Ranking and Selection Process
5. Evaluation of Human Health and Ecological Risks at Federal Contaminated Sites
6. Expenditure Tables – a: Program Expenditure
b: Detailed Department Expenditures

Appendix 1: Reports on Progress at Individual FCSAAP Sites

Indian and Northern Affairs / Northern Affairs Program

Site Name: **Clinton Creek Mine** (Yukon)

	2003-2004	2004-2005
FCSAAP expenditures to date	\$604,265	\$799,958

Nature of contamination: There is concern about the physical stability of the lake outlet, the failure of which will result in a catastrophic flood (12,000,000 m³ of water) resulting in potential loss of life, loss of property and loss of critical salmon habitat. A breach could potentially impact the international waters of the Yukon River.

Also unstable are the asbestos tailings (10 million tonnes) and asbestos waste rock (60 million tonnes). The potential physical impacts are as above, and the uncontrolled release of large quantities of air and water-borne asbestos fibres will result in the contamination of a large area. Concentrations of airborne fibres are anticipated being in excess of health guidelines and would impact several km² surrounding the site.

Seasonal hydrogen sulphide gas releases from the lake potentially impact the local area. Hydrogen sulphide gases in water negatively impact lake water quality.

Work Completed Fiscal Year 2004-2005: Activities related to regulatory approvals including environmental assessments and permitting of activities (land use permits, water license). Following the Letter of Advice from DFO, stranded fish will be rescued from the stagnant pools in the creek bed and released into Hudgeon Lake or downstream of Wolverine Creek. In March 2004, project updates and discussions on the final closure plan began. Hän Construction Ltd, which belongs to the Tr'ondëk Hwëch'in First Nation, is participating in the current remediation activities and would like to be included in the final closure plan activities. Consultations with the Workers Compensation Board are also taking place due to the concerns surrounding airborne asbestos. Assessments have included an air-borne asbestos risk assessment and report completion, and the conducting of tailings remediation investigations. Demolition of some of the site's physical hazards (e.g. crusher building, mill area infrastructure, ammonium nitrate/fuel oil [ANFO] storage area, tramway towers) also commenced in 2004-2005. An annual water and air sampling program is ongoing.

Site Name: **Colomac Mine** (Northwest Territories)

	2003-2004	2004-2005
FCSAAP expenditures to date	\$10,500,000	\$8,331,100

Nature of contamination: The main concerns at Colomac are the Tailing Containment Area (TCA) which is leaking underneath one dam (and will be filled by about 2006); hydrocarbon contamination around the tank farm; contamination from tailings and other spills; and hazardous chemicals and chemical conditions (e.g., open pits, buildings in disrepair).

The main pathways for exposure to cyanides and metals are discharges of tailings water to the environment now and in the future when the TCA is full. This impacts the food chains of wildlife and humans at downstream Colomac. Caribou, moose and other wildlife are exposed to the tailings. The impacts are to humans consuming these animals and workers and visitors at the site. The main pathway for exposure to the hydrocarbons is seepage (percolation of water through the soil) to nearby Steeves Lake and aquatic food chain transfers.

The current plan for remediating Colomac is as follows:

- Environmental assessment and licensing – 2004-2006

- Tailings containment area remediation – 2006-2008
- Water discharge – starting in 2008
- Other remediation – 2004-2009
- Confirmatory monitoring – 2008-2013

Work Completed Fiscal Year 2004-2005: INAC submitted its remediation plan for Colomac to the Mackenzie Valley Land and Water Board (MVLWB) on March 31, 2004. This plan was made publicly available in 2004-2005 by the MVLWB and was well received by the Tlicho communities, government departments and other people concerned with the project. The Board determined that there would be no significant impacts on the environment once the plan is carried out, and decided to move to an Environmental Assessment of the plan. The project proceeded directly to the licensing stage. The Board scheduled a public hearing for November 4 and 5, 2004. No concerns were submitted and the Board agreed to cancel the hearing. Other activities conducted in 2004-2005 include the removal of tailings-contaminated soil near the mill; construction of a diversion ditch around the tank farm area that will ensure that clean surface water does not come in contact with the tank farm area during remediation activities (demolition of the tank farm was completed in 2003-2004); construction of a “barrier wall” between the tank farm and Steeves Lake; and construction of a land treatment unit (LTU) that will remediate oily soils from the tank farm area using bacteria to break down the oil in the soil. Work also continued on the Enhanced Natural Remediation (ENR) option for treating tailings water.

Site Name: Discovery Mine (Northwest Territories)
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FCSAAP expenditures to date	2004-2005
	\$2,553,046

Nature of contamination There are residual exposed mine tailings with elevated arsenic, lead, nickel, and zinc. The concentration of arsenic is more than twice the CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health – Residential / Parkland land use. In addition, the former borrow pit at the site has high total suspended solids (TSS) and turbidity, and discharges to Giaque Lake if no intervention is undertaken.

Work Completed Fiscal Year 2004-2005: Reclamation activities began in 1998 and continue today. Activities conducted in 2004-2005 include additional assessment work as well as the submission of a Remediation Plan to the Mackenzie Valley Land and Water Board (MVLWB). Approval of the Remediation Plan was obtained quickly because the tailings were already covered, and the mobilization occurred in March 2005 via a winter road.

Site Name: FOX C - Ekalugad Fiord (Nunavut)
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FCSAAP expenditures to date	2004-2005
	\$1,051,861

Nature of contamination The site, a former Intermediate DEW Line station operated between 1957 and 1963 and is littered with debris (10,000 barrels, deteriorating buildings, equipment) and contaminated with PCBs, asbestos, petroleum hydrocarbons and heavy metals.

Work Completed Fiscal Year 2004-2005: Approximately 10,000 drums have been identified at various locations within the site. Some dry, empty barrels strewn around the site were collected and returned to a central location for crushing. Contaminated soil delineation was completed, and an inventory of all hazardous material was completed at each of the structures remaining at the site. A risk assessment was also completed, and an environmental site study was done on the water, soil, sediment, and hazardous materials/wastes found on the site. A Geotechnical & Geophysical Study was also done, and there was an assessment completed on the existing four landfills. The access road was also evaluated.

Site Name: **Faro Mine** (Yukon)

	2003-2004	2004-2005
FCSAAP expenditures to date	\$9,847,858	\$10,677,518

Nature of contamination: The site was the largest zinc/lead mining operation in Canada. A large tailings depression holds an estimated 54 million tonnes of zinc-contaminated tailings. The primary concern is the chemical stability of the tailings solids and the potential for oxidation/acid generation and the subsequent flushing of contaminants from the tailings into the sand and gravel aquifer (underground body of water) that underlies this area. Proactive water management is critical to protecting the surrounding aquatic environment from zinc contamination.

Numerous health and safety hazards exist within the mine complex, including deteriorating buildings, open excavations, and lead exposure.

Work Completed Fiscal Year 2004-2005: This year a variety of work activities were done, including: water management requirements; upgrading mine site facilities to the required standards; rehabilitation of the electrical infrastructure; formalization of the Operations Procedures Manual and Employee Environmental Health and Safety (EHS) Training; in-situ treatment of Grum Pit; the submission of an application to modify the water license; consultations; continued Acid Rock Drainage (ARD) monitoring; improvement of waste rock dump water balance; continued tailings groundwater study; and the development of a soil remediation plan.

Site Name: **Giant Mine** (Northwest Territories)

	2003-2004	2004-2005
FCSAAP expenditures to date	\$5,787,844	\$6,787,402

Nature of contamination: Approximately 237,000 tonnes of highly toxic arsenic trioxide is stored underground at the site. In addition, arsenic-contaminated buildings, soils and tailings on the site represent hazards to human health. Pathways (routes through which chemicals can move and affect human health and the environment) of exposure would involve release of arsenic-contaminated water from the mine into Baker Creek and/or Back Bay/Yellowknife Bay. There is also potential for airborne release of arsenic from contaminated sources on surface.

Work Completed Fiscal Year 2004-2005: Staff at the Giant Mine Site were able to complete the integration of the project description for the long-term management of the arsenic trioxide dust with the surface abandonment and reclamation plan. This work will assist the Interim Office in developing the final Giant Mine Remediation Plan, which is expected to be completed in 2005-06. Other activities conducted at the site in 2004-2005 include care and maintenance activities (i.e., pumping and treating contaminated water, inspections and monitoring of accessible bulkheads that provide arsenic trioxide containment); site investigation and assessment (i.e., collection of additional baseline data for the site and geotechnical investigations of the chambers and stopes containing arsenic trioxide); consultation (i.e., ongoing communication activities through the Community Alliance, media visits to the site by Global TV and *The Nature of Things*, and visits by local community groups such as the Yellowknives Dene First Nation (YKDFN)); and ongoing water monitoring.

After a competitive contracting process, an Aboriginal and Northern company joint venture contractor was awarded the contract for care and maintenance of the site. This company will assume full responsibility for care and maintenance at the site, including security, in July 2005.

Site Name: **Mount Nansen Mine** (Yukon)

FCSAAP expenditures to date	2003-2004	2004-2005
	\$667,162	\$932,180

Nature of contamination: The tailings pond at the site was not properly constructed or operated, and water levels must be carefully managed to prevent instability. Each summer, accumulated contaminated water is withdrawn from the tailings pond, treated, and then discharged to the environment, to make room for the next winter's snowmelt and summer runoff. Contaminated water also seeps below the dam and must be continually captured and pumped back into the pond.

Another significant source of contaminants on the site is heavy metals contamination of the Brown-McDade open pit water. Each fall this water is pumped to the mill's treatment plant, treated and released to the environment. This provides sufficient storage for the winter inflow from seeps and groundwater leakage from the adjacent Back Creek.

Work Completed Fiscal Year 2004-2005: Tailings pond water and Brown McDade pit water was treated and released between late June and early September. Seepage pond water was pumped year round as it would overtop in a three to five day period. The water diversion for Dome Creek was cleaned out on a regular basis; ice was removed for spring freshet. Consultations with the Little Salmon/Carmacks First Nation (LSCFN) with regards to the final closure occurred that year. Hydrogeological and geochemical studies of the Brown McDade pit were initiated in early 2004. Water monitoring included water treatment monitoring and receiving waters quality. Miscellaneous monitoring covered pit levels, meteorological data and tailings dam characteristics.

Site Name: **Port Radium Mine** (Northwest Territories)

FCSAAP expenditures to date	2004-2005
	\$1,301,589

Nature of contamination Approximately 1.7 million tonnes of uranium and silver tailings exist on the site (contained) and in Great Bear Lake (uncontained). Risks considered are radiological hazard and metals toxicity.

Work Completed Fiscal Year 2004-2005: The remaining health studies were completed and the final results of these studies were communicated to the community. A remediation plan was developed, as well as a project description for regulatory agencies.

Site Name: **BAF 5 – Resolution Island** (Nunavut)

FCSAAP expenditures to date	2003-2004	2004-2005
	\$8,936,700	\$7,154,394

Nature of contamination: The site contains a number of health and safety hazards including 20 buildings in various states of disrepair; approximately 20,000 m³ of soil contaminated with polychlorinated biphenyl (PCB), lead, cobalt, hydrocarbons, mercury and copper; various hazardous materials including batteries, PCB liquids, asbestos, fuels, fuel-tank sludge, lubricating oils, solvents, alcohol, glycol, heavy metals and contaminated liquids; and eight landfills.

There are several sources of aquatic contaminants that represent previous and potential violations of Section 36 of the *Fisheries Act* including PCB liquids draining to the sea.

Work Completed Fiscal Year 2004-2005: The following activities occurred: mobilisation and demobilisation of the camp as well as refuelling; excavation of soil; containerisation of over 2,000 m³ of CEPA (> 50ppm PCB) impacted soil; collection and consolidation of all hazardous waste; production of over 33,000 m³ of clean fill; construction and operation of the Hydrocarbon Landfarm facility; demolition of last remaining PCB contaminated building; remediation of the old Airstrip dump site; complete construction of two non-hazardous landfills and a Tier II engineered landfill; collection of various physical debris; training; analytical work and research in Landfarm and PCB barrier technique.

Site Name: **CAM F - Sarcpa Lake** (Nunavut)

FCSAAP expenditures to date	2004-2005
	\$912,229

Nature of contamination The site, a former Intermediate DEW Line Station, has a number of health and safety hazards of particular concern as the site is used as a camp by hunters from Igloodik and Hall Beach. These hazards include debris, abandoned drums and contaminated soil containing elevated levels of PCBs and inorganic elements such as zinc, cadmium, lead and copper. Currently PCB contaminated soils are stored in approved containers in a registered warehouse.

Work Completed Fiscal Year 2004-2005: Approximately 7,000 drums have been identified at various locations within the site and have been assessed. Contaminated soil delineation was completed at the site and an inventory of all hazardous material was completed at each of the structures remaining at the site. A Geotechnical and Geophysical Study Assessment of existing two landfills, an evaluation of the airstrip, and a risk assessment were also completed in 2004-2005, as well as removal and destruction of barrelled PCBs.

Site Name: **Silver Bear Mines** (Northwest Territories)

FCSAAP expenditures to date	2004-2005
	\$791,239

Nature of contamination Arsenic and other heavy metals. Tailings solids are transported out of the impoundments during run-off. Hydrocarbon seep at Terra Mine.

Silver Bear Mines includes four properties in the Camsell River area, located 280 km northwest of Yellowknife, which have been grouped together because of their close proximity to one another. These mines produced silver, copper, and bismuth between 1960 and the early 1980s. The Silver Bear properties include Terra Mine, Northrim Mine, Norex Mine, Graham Vein and Smallwood Mine.

Work Completed Fiscal Year 2004-2005: Detailed investigations and engineering studies were prepared for the specifications for remediation, and site mobilization for cleanup. Specific activities included the posting of signs to warn people about the risks of entering the site and securing buildings to prevent entry, the submission of a land use permit application to incinerate waste oils and fuels onsite, consultation with the affected First Nations in the Sahtu and Tlicho land claim areas, and the completion of detailed studies to refine remediation requirements and selection of remediation options. Site remediation work was done to incinerate waste oil and to collect and package laboratory chemicals to be disposed off site at an approved facility. Aquatic studies were done to determine baseline conditions, as well as the potential for environmental impacts from the site.

Site Name: **Tundra-Taurcanis Mine** (Northwest Territories)

FCSAAP expenditures to date	2004-2005
	\$1,207,804

Nature of contamination Arsenic levels in the tailings pond are 100 times the CCME guidelines and elevated levels of arsenic above guidelines can be found in Hambone and Transaddle Lake downstream of the tailings pond.

Work Completed Fiscal Year 2004-2005: Studies were completed on the Tailings Containment Area (TCA) to develop technically sound remediation options, and a draft remediation plan for consultation and regulatory approvals was prepared. Care and maintenance activities focused on repairs to cracks and slope erosion of the dams around the TCA, after a land use permit was obtained to conduct the work on site. The site was also secured by posting signs, and collecting hazardous chemicals for off-site disposal. To develop the closure plan for the TCA, further assessment of the water column, the pore water, the tailings and seepage outside the dams was done. Water quality and aquatic biota was characterized of the local watershed to determine potential impact. Waste rock piles were mapped and a detailed sampling program of seepage was also conducted.

Site Name: **United Keno Hill Mine** (Yukon)

	2003-2004	2004-2005
FCSAAP expenditures to date	\$1,354,786	\$2,636,530

Nature of contamination The contaminants of concern at the site are groundwater from the mine containing elevated concentrations of zinc, arsenic, cadmium, lead and other metals; tailings with elevated metals (arsenic, lead, cadmium); PCBs; asbestos; tailings dust; and there is a potential for acid rock drainage if the metals are exposed to oxygen.

Work Completed Fiscal Year 2004-2005: Continued water treatment at five separate locations, and site security activities. Some permits and licensing were required for the offsite removal, transport and disposal of PCBs and hazardous chemicals. Water treatment optimization work was done, and water monitoring is ongoing. The tailings dam spillway was lowered to improve the physical stability of the dams, as well as removal of hazardous chemicals and PCBs, and power-line remediation (removal of abandoned poles and wire).

Indian and Northern Affairs / Indian and Inuit Affairs Program

Site Name: **Barren Lands** (Manitoba)

	2004-2005
FCSAAP expenditures to date	\$2,072,887

Nature of contamination: The contamination consisted of petroleum hydrocarbon in the form of diesel fuel that leaked into the ground from storage tanks and/or day tanks located at an old diesel generator and a motel site. These facilities were established in the 1950's and likely have been leaking for some time, impacting both the soil and groundwater to the levels exceeding the Canadian Council of Ministers of the Environment (CCME) Canada-wide Standard (CWS) guidelines for commercial and public use.

Work Completed Fiscal Year 2004-2005: The original scope of the project included all the three separate plumes identified in 2002 Phase II Environmental Site Assessment (ESA); however, it became quickly evident after the completion of the supplementary plume delineation that the scope of work will significantly increase far beyond the original budget. It was agreed that it is best to limit the scope to a major plume under Stage I, which was moving in the direction of the lake, with the understanding that the rest of the original scope of work, including landfarming, will be undertaken in Stage II. Stage I is now substantially complete (80 percent), with the remaining activities to be completed in 05-06. Some of the activities undertaken in Stage I included: design and tender, evaluation of the sewage system's capacity to handle and ability to resist hydrocarbon-impacted water, contaminated soil (7948 m³), uncontaminated soil (5948 m³), imported clean fill (6824 m³), contaminated groundwater (13000 m³) was hauled to the sewage lagoon where degradation of the hydrocarbons is expected to occur through volatilization induced by air stripping, photochemical degradation and biodegradation, and landfarm development.

Site Name: **Oxford House** (Manitoba)

FCSAAP expenditures to date	2004-2005
	\$551,880

Nature of contamination Over the years, a leaky tankfarm and piping system released petroleum hydrocarbon (diesel fuel) into the ground, resulting in an extensive impact within the tankfarm facility and significant impact near and in the crawl space of the main school building and some teacherages. The tankfarm supplied fuel for school complex's heating system and consisted of eight 75000 L above ground storage tanks (AST).

Work Completed Fiscal Year 2004-2005: The First Nation, with the assistance of the tribal council implemented the entire project, under the Construction Management Procurement Approach. Approximately 75 percent of the scope of work was completed in 2004-2005, including design and tender, rehabilitation of the existing landfarm and access road, demolition of the duplex teacherage, contaminated soil (6750 m³), uncontaminated soil (4000 m³), imported clean fill (5900 m³), landscaping, and landfarm operation. The remaining 25 percent of the work could not be undertaken due to wet conditions in the late fall of 2004, and was deferred to 05-06.

National Defence

Site Name: **Colwood Aggregate** (British Columbia)

FCSAAP expenditures to date	2004-2005
	\$1,222,798

Nature of contamination: The contaminants of concern at the site are elevated concentrations of heavy metals, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), and other organic compounds, which are found in the soil. Contamination is the result of fire fighter training and historical fuel facility spills.

The remediation project consists of works at three nearby sites. Known contaminated areas are currently covered by existing infrastructure (concrete pad and structures for the Fire Fighting Training Area (FFTA), pipeline for F-jetty, and concrete pad and structures for the oily waste water treatment plant (OWWTP)). The infrastructure must be removed to allow delineation and excavation of contaminated soils. The excavated contaminated soils will then be either shipped off-site for disposal or moved to an on-site engineered biocell.

Work Completed Fiscal Year 2004-2005: The removal of the FFTA infrastructure, and the FFTA Closure Report were completed. The remediation of the FFTA soils is 90 percent complete, and is expected to be finished in 05-06. The removal of the Lower Pipeline infrastructure was completed, and remediation of these soils is currently 80 percent complete. This work will be completed in 05-06, along with the remediation of the OWWTP soils (20 percent complete).

Site Name: **DYE-M Cape Dyer** (Nunavut)

	2004-2005
FCSAAP expenditures to date	\$4,189,678

Nature of contamination: The site is an active north warning system long-range radar site and is located on Baffin Island. It consists of upper (300 m above mean sea level (amsl)) and lower site: relatively flat terrain, boulder cover with sparse vegetation, underlying soil and gravel. The surrounding area soil is characterized with having high background metal concentrations.

A contractor is to conduct remediation of contamination on site during summer months. The hazardous contamination will be packaged and shipped off site to a hazardous waste disposal facility. Hydrocarbon contaminated soils will be excavated and placed in an engineered landfarm. Other contaminated soils will be excavated and placed in an engineered landfill.

Work Completed Fiscal Year 2004-2005: Confirmatory sampling was conducted. Work in 2004-2005 included mobilization on the site and permitting. Short and long-term monitoring will follow remediation.

Site Name: **FOX-M Hall Beach** (Nunavut)

	2003-2004	2004-2005
FCSAAP expenditures to date	\$3,389,000	\$3,474,404

Nature of contamination: Contaminants present are arsenic, cadmium, copper, chromium, lead and total petroleum hydrocarbons (TPH) that exceed Canada-wide Standards for petroleum hydrocarbons (PHC) in soil.

Work Completed Fiscal Year 2004-2005: On-site contamination was remediated during the summer months. This involved the construction of Cell 1 of Tier II Disposal Facility, a Non-Hazardous Waste Landfill, and a landfarm. Excavation of 304 linear metres took place in the East Beach Key Trench. Two dormitories, a curling rink building and fuel tank W22C were demolished, and asbestos was removed from demolished buildings. As well, 19 monitoring wells were installed.

Site Name: **Harvey Barracks- COMPLETED** (Alberta)

	2003-2004	2004-2005
FCSAAP expenditures to date	\$6,304,738	\$1,971,511

Nature of contamination: The practice area lands consist of the former small arms ranges, obstacle course and dryland training areas. The Barracks' lands also encompass the former housing area, mess, fire hall, hospital, etc. Types of contamination detected above the remedial criteria derived for the Harvey Barracks area (Tsuu T'ina residential area), include TPH (total petroleum hydrocarbons), metals, BTEX (benzene, toluene, ethylbenzene, and xylene – from fuels), PAHs (polycyclic aromatic hydrocarbons), VOCs (volatile organic compounds – i.e., solvents, degreasers, paints, thinners and fuels), asbestos and medical waste. There was a need to address these sites as quickly as possible since there was a risk of contamination of the Elbow River. In addition, the government was required to meet its obligations with respect to the 1991 Settlement Agreement signed between DND, INAC, and the Tsuu T'ina Nation.

Harvey Barracks is comprised of six large-scale sites, which, due to their close proximity to each other, were jointly remediated. The six sites are:

Buffalo Range: The Buffalo Buttress site consists of lead contaminated in excess of the lead leachate criteria and is adjacent to the Elbow River.

Elbow River: Two sites in the Elbow River Escarpment consist of waste material, paints solvents, PAHs, and metal contamination.

Chemical Warfare Area: A former chemical warfare storage site is located in a drainage area near the Elbow River.

Asbestos Site: An asbestos contaminated site containing waste material.

Medical Waste Area: A site containing mixed waste from a former medical facility.

Work Completed Fiscal Year 2004-2005: In 2004-2005, the chemical waste from the Medical Waste Area and Asbestos Site were excavated and separated. UXO Screening of the Medical Waste Area and Asbestos Site was completed and neutralization was undertaken as necessary. Waste material from the Medical Waste Area and Asbestos Site was classified and transported to appropriate licensed landfill sites. The site was restored (backfill, etc.) and site closure activities were completed (record keeping, archiving of information, etc.). This project has completed Step 9 of "A Federal Approach to Contaminated Sites". No further work that qualifies for FCSAP funding is anticipated at this time.

Site Name: **PIN-4 Byron Bay** (Nunavut)

	2003-2004	2004-2005
FCSAAP expenditures to date	\$1,603,000	\$47,597

Nature of contamination: Soils are contaminated with petroleum hydrocarbons, PAHs (polycyclic aromatic hydrocarbons) and heavy metals. Toxic organics such as PCBs exist in painted surfaces on various structures.

Work Completed Fiscal Year 2004-2005: On-site contamination was remediated during the summer months. This involved packaging hazardous contamination and shipping it off-site to a hazardous waste disposal facility. Hydrocarbon-contaminated soils were excavated and placed in an engineered landfarm. Other contaminated soils were excavated and placed in an engineered landfill. A Land Use Permit and a Water Use License were obtained. A Final Site Investigation (SI) Environmental Report was completed, and the review by the Environmental Working Group (EWG) of the Final SI Environmental Report & Recommendations is 80 percent complete. Confirmatory sampling will be conducted and short- and long-term monitoring will continue following remediation.

Site Name: **Saglek PCB** (Newfoundland)

	2003-2004	2004-2005
FCSAAP expenditures to date	\$12,068,000	\$5,495,000

Nature of contamination: The Saglek Soil Remediation project deals with 20,000 m³ of excavated PCB-contaminated soil, that migrated via erosion/sedimentation within DND property and off DND property into Saglek Bay, impacting the ecosystem and the food chain. This soil required action as the staging area it was located in was only temporary in nature and not a long-term solution for protection.

Work Completed Fiscal Year 2004-2005: Several distinct PCB contaminated sites at Saglek were assessed and remediated in accordance with site-specific clean up criteria. Approximately 20,000 m³ of PCB contaminated soil was excavated and stockpiled in a staging area. Remedial work was completed in 2004-2005, with short and long-term monitoring remaining. Hazardous contamination was packaged and shipped off site to a hazardous waste disposal facility, and hydrocarbon contaminated soils were excavated, treated, and placed in engineered land farm. Other contaminated soils were excavated and placed in an engineered landfill. The demolition of surplus buildings, fuel tanks, radars and radomes was completed. As well, confirmatory sampling was terminated and demobilization from the site was completed.

Site Name: **Suffield EPG** (Alberta)

	2003-2004	2004-2005
FCSAAP expenditures to date	\$64,000	\$500,868

Nature of contamination: The contamination on this site has resulted from past practices for destruction and dumping of chemical and biological warfare agents and lab chemicals. In some sites actual agents may still remain whereas in others their residual breakdown by-products remain. The agents most likely to remain include mustard (HD or LD) and VX. The by-products of natural breakdown of agents include thiodiglycol and polysulfides. Analysis of areas where mustard was destroyed by burning, or stored, has indicated elevated levels of many compounds including arsenic, boron, copper, sulphur and zinc. The sites are considered toxic, and if either is disturbed or dug into by animals or humans, exposure could be fatal.

Work Completed Fiscal Year 2004-2005: The Treatability Study is 98 percent complete, and the laboratory component has been completed. The mounting of capability for the high-risk sites (equipment, personnel, training) has begun (five percent complete), and the development of field procedures for the high-risk sites is 33 percent complete. Remediation of all sites was initiated in 2004-2005, but work was halted due to the discovery of anomalous items during excavation.

Site Name : **TCE Contamination Valcartier** (Quebec)

	2003-2004	2004-2005
FCSAAP expenditures to date	\$449,000	\$1,520,400

Nature of contamination: A major regional aquifer has been contaminated by trichloroethylene (TCE). The primary concern at the site is the contamination of the groundwater, which is used as a potable drinking water source within the surrounding area (Shannon Township).

Work Completed Fiscal Year 2004-2005: The project faced some delays due to unanticipated assessment costs. The need to complete the assessments on the northwest, ValBelair and Shannon sides of the site overrode a number of remedial initiatives that were to be completed in fiscal year 2004-2005. The Remediation investigation / feasibility studies (RI/FS) was completed on the northwest side, and approximately 30 percent of the RI/FS was completed for ValBelair and the southeast side of base.

Site Name: **5 Wing Goose Bay – Survival Tank Farm** (Newfoundland)

FCSAAP expenditures to date	2004-2005
	\$128,412

Nature of contamination: The 5 Wing Survival Tank Farm originally consisted of nine above ground fuel tanks, with a total capacity of 95,400,000 L. Partially decommissioned in the early 1990's, the site has confirmed exceeded acceptable levels of metals, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), and BTEX (benzene, toluene, ethylbenzene, and xylene) in the groundwater, as well as petroleum hydrocarbons and BTEX in the soil.

The initial phase of the project included the decommissioning, removal and disposal of the tanks, pipelines and associated structures. This work was completed by DND in fiscal year 2003-04.

Work Completed Fiscal Year 2004-2005: The second phase of the project includes an in-depth field investigation, identifying the extent of contamination and to fill any information gaps existing for the site. The scope of this work will also entail the evaluation and recommendation of remediation alternatives for efficient clean up of the site. In addition to the site investigation, a risk assessment and environmental assessment will be carried out. Phase II was initially planned for completion in 2004-2005; however, due to insufficient site information, a short summer season, and delays in project initiation, the site investigation was only partially completed.

The third phase of this project will be the removal of any free product and remediation of soil and groundwater associated with the site. The last phase of this project will consist of annual site monitoring.

Site Name: **5 Wing Goose Bay – Upper Tank Farm** (Newfoundland)

FCSAAP expenditures to date	2004-2005
	\$358,337

Nature of contamination: This project is designed to remediate free-phase hydrocarbon plumes at 5 Wing Goose Bay's Upper Tank Farm and has been underway since the late 1980s. Current remedial activities are aimed at dealing with both diesel and aviation fuel plumes and protecting downstream receptors including the Churchill River.

Work Completed Fiscal Year 2004-2005: Maintenance and operation of the existing liquid and vapour extraction pumps; the monitoring of over 1300 wells and sampling points; and the disposal of the fuel and treatment of the contaminated soils were undertaken. (It is estimated that some 63 million litres of fuel and contaminated ground water will be treated annually as a result of these activities). In addition, the remediation system underwent an engineering review to optimize system operation. The Fuel Recovery Operation and Plume Delineation are 80 percent complete. The fuel recovery operation was temporarily shut down to allow groundwater to reach equilibrium.

The remediation contract was awarded upon receiving the allocated funding. The late contract award limited the amount of work that could be completed before the winter freeze suspended operations at the Upper Tank Farm Fuel Recovery Site.

Site Name: **14 Wing Greenwood** (Nova Scotia)

FCSAAP expenditures to date	2004-2005
	\$558,259

Nature of contamination: Original contaminants of concern identified at the site include: soil, sediment, surface water and groundwater impacted (in varying degrees) by metals, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and petroleum hydrocarbons. Levels of arsenic were also found in the surface soil that may present a potential human health risk. The impacts have been noted to be due, in part, to historical site usages by Base operations (training, maintenance, storage, landfill etc.).

Work Completed Fiscal Year 2004-2005: Work completed in 2004-2005 included the Detailed Remediation Option Analysis, Environmental Assessment (EA) Screening, tender engineering design of remedial work based upon recommendations, removal of Construction Engineering (CE) stockpiles and the preparation of the site for construction activities. As well, a Stockpile Compound was designed and constructed at the former main landfill to receive materials stockpiled within the construction area. Work was also done to construct the Phase I remedial design, excluding the Central Heating Plant (CHP) and an assigned buffer zone surrounding the heating plant, and construction of the remedial design was completed. Finally, the development of the engineering design and technical specifications, and the tendering and award of the construction contract for the 2005-2006 activities were also finalized.

Site Name: **CAM-2 Gladman Point** (Nunavut)

FCSAAP expenditures to date	2004-2005
	\$3,243,387

Nature of contamination: CAM-2 is a decommissioned radar site. Soils consist of gravel and sand with small amounts of silt and clay. Geology and vegetation are consistent with the Arctic environment. The clean-up operation is focused on dealing with both physical debris removal and soil and possible groundwater contamination at the site due to past practices and materials considered acceptable at the time of construction/operations. Contaminants of concern include heavy metals, PCBs, PAHs (polycyclic aromatic hydrocarbons), petroleum hydrocarbons, and asbestos building materials that are considered potential risks to human health and the environment.

Work Completed Fiscal Year 2004-2005: A contractor has completed the remediation of contamination on-site. Ongoing remedial tasks include:

- remediation of contamination,
- excavation and placement of hydrocarbon contaminated soils in an engineered landfarm,
- excavation and placement of contaminated soil in an engineered landfill,
- packaging of hazardous contamination,
- confirmatory sampling,
- shipment of hazardous contamination off-site to a hazardous waste disposal facility, and
- short and long-term monitoring as a risk management measure associated with engineered landfills.

Fisheries and Oceans

Site Name: **Belleville Small Craft Harbour** (Ontario)

FCSAAP expenditures to date	2003-2004	2004-2005
	\$41,415	\$175,000

Nature of contamination: There are two contaminated sites on federally owned property:

- 1) Zwick's Island East has been impacted by an inactive landfill directly adjacent to the federal property. Contaminants on the site include iron, manganese, TPH (total petroleum hydrocarbons), PAHs (polycyclic aromatic hydrocarbons), and ammonia.
- 2) Meyers Pier Park site is primarily comprised of industrial waste fill and was used for bulk storage of coal and petroleum fuel between 1931 and 1990. Elevated levels of PAHs, TPH and heavy metals have been detected. Contamination reportedly extends off site to residential areas. There are contaminated sediments in the harbour basin and at the mouth of the Moira River, and elevated zinc levels have been identified in the surface water of the marina.

Work Completed Fiscal Year 2004-2005:

- 1) Zwick's Island was capped with clean material, a phyto remediation system was installed to protect the creek flowing through the site, and ground and surface water were monitored. Also a short section of Waterloo barrier which is proposed as an option for Meyers Pier Park, was installed on Zwick's Island on a trial basis.
- 2) Myers Pier Park remediation plans continue to be developed by DFO. Simultaneously the City of Belleville is planning improvements to the park to be implemented in conjunction with the remediation as part of a long term waterfront park development

Site Name: **Lightstations (20 sites)** (British Columbia)

FCSAAP expenditures to date	2004-2005
	\$67,200

Project Names: Cape Beale, Cape Mudge, Carmanah Point, Chatham Point, Chrome Island Range, Egg Island, Entrance Island, Estevan Point, Green Island, Ivory Island, Langara Island, Lennard Island, McInnes Island, Merry Island, Nootka Island, Pachena Point, Pine Island, Quatsino (Kains Island), Scarlett Point, and Trial Islands.

Nature of contamination: The contaminants of concern at these sites are elevated concentrations of heavy metals (arsenic and lead), petroleum hydrocarbons, and polycyclic aromatic hydrocarbons (PAHs), which are found in the surface soil.

Note: PAHs were not found on two sites – Egg Island and Cape Beale.

Work Completed Fiscal Year 2004-2005: Risk management on these sites will continue indefinitely, with sampling of surface water and mussels in the inter-tidal zone as an indicator of contaminant migration from the terrestrial to the marine environment continuing every second year. DFO began developing a blood-lead monitoring program to monitor human exposure to lead (the most widespread metal soil contaminant). On three sites (Carmanah Point, McInnes Island, and Egg Island), an on-site land farm was established to handle petroleum hydrocarbon-contaminated soil from this site, and DFO will continue monitoring until soil falls within CCME guidelines. On one project (Quatsino), an on-site biocell was established to handle petroleum hydrocarbon-contaminated soil from this site and it will continue to be monitored until soil falls

within Canadian Council of Ministers of the Environment (CCME) guidelines. As well, Trial Islands provides habitat for a large number of plant species at risk, and these populations are monitored annually.

Health Canada

Site Name: **Kasabonika** (Ontario)

FCSAAP expenditures to date	2004-2005
	\$448,980

Nature of contamination: The soil in the vicinity of the Nursing Station at Kasabonika Lake is contaminated by diesel fuel oil.

Work Completed Fiscal Year 2004-2005: The remediation action plan was developed and an environmental assessment was completed under the Canadian Environment Assessment Act (CEAA). The impacted soil was excavated and shipped to an off-site landfill for bioremediation treatment to begin. In-situ bioremediation was initiated in one area due to the presence of a building that could not be moved.

Site Name: **Lansdowne House** (Ontario)

FCSAAP expenditures to date	2004-2005
	\$244,800

Nature of contamination: The soil in the vicinity of the former nursing station at Lansdowne House is contaminated by diesel fuel oil.

Work Completed Fiscal Year 2004-2005: A site-specific risk assessment was completed, and the remediation objectives and action plan were developed. An environmental assessment under the Canadian Environment Assessment Act (CEAA) was also completed, and the materials and equipment necessary for remediation were mobilized at the nursing station.

Site Name: **Weagamow Lake** (Ontario)

FCSAAP expenditures to date	2003-2004	2004-2005
	\$309,517	\$942,992

Nature of contamination: The former nursing station at Weagamow Lake is contaminated with PHCs (petroleum hydrocarbons). There are 14,600 tonnes that exceed the applicable criteria. It is estimated that 39,000 litres of liquid-phase petroleum hydrocarbons are present at the site.

Work Completed Fiscal Year 2004-2005: The on-site office, materials, and equipment necessary for excavation and shipment of impacted soil were organized at the site of the former nursing station. The impacted soil was excavated and shipped to the bioremediation facility. The liquid petroleum hydrocarbons that were encountered during excavation were also recovered. The excavated area was backfilled and restored. Groundwater-pump and treat activities continued for a fourth year.

Environment Canada

Site Name: **Pacific Environment Centre (PEC)** (British Columbia)

	2003-2004	2004-2005
FCSAAP expenditures to date	\$1,009,384	\$512,504

Nature of contamination: This 55 acre parcel has been subjected to unauthorized deposit and dispersal of contaminants, including spilled or buried copper, lead and zinc ore concentrate, sulphur, tar, asphalt, miscellaneous domestic waste and waste pulp and paper.

Work Completed Fiscal Year 2004-2005: Phase II delineation was done on Area 1 (former sublease), Area 2 (PEC Site Proper east and west of the Greater Vancouver Regional District (GVRD) right of way), Area 3 (western half of the PEC site proper), Area 4A (low lying area in the south central), the Lagoon Area (west of the PEC site) and the Burrard Inlet Foreshore, south of the PEC site. Infrastructure, such as roadways and storage cells, were constructed or maintained. Tar and asphalt was excavated and stockpiled for Area 2 (west of the GVRD right of way). Annual monitoring was conducted on the Pilot Scale and Full Scale Permeable Reactive Barriers. Groundwater quality and flow and air and dust-fall deposition of ore concentrates were monitored on the site, and Phase IV: "Development of the area-wide groundwater model", was completed.

Transport Canada

Site Name: **Former Remote Radar Site 59 (Gander)** (Newfoundland)

	2004-2005
FCSAAP expenditures to date	\$2,100,000

Nature of contamination: Abandoned former United States military site located on Gander International Airport in the Thomas Howe Demonstration Forest along the Trans Canada Trail network. On-site buildings were demolished down to the foundations and ground surface levelled (assumed completed by the Military) with exception of a larger partially buried bunker. During this process, various pieces of debris, including items containing or coated with PCBs, were mixed into the ground resulting in several hot spot areas heavily contaminated with PCBs. The nearest water body is a creek that is located approximately 250m to the south of the sites.

Work Completed Fiscal Year 2004-2005: During 2004-2005, 1,535m³ of soil was excavated, transported to the soil disposal facility and treated. In the course of completing the work, a "hotspot" of heavily impacted PCB soil was identified. The soil was located under one of the old concrete tower bases. It is estimated that an additional 350m³ of soil requiring treatment was still present on the site at the end of 2004-2005.

Site Name: **Rock Bay** (British Columbia)

FCSAAP expenditures to date	2004-2005
	\$4,451,509

Nature of contamination: Several industrial operations historically occurred at the Rock Bay site, the most significant of which was a manufactured gas plant, which produced coal tar (high in PAH), metals, and cyanide as waste by-products. Groundwater has been impacted by these main contaminants.

Work Completed Fiscal Year 2004-2005: There has been consultation with federal, provincial, and local environmental and regulatory agencies. The public, including First Nations, have been consulted through the following: presentations to community groups and the municipal government; newsletters distributed to the neighbourhood; and a community information office, which has been established.

The remediation project has been divided into three stages, and the main components of the remediation plan are: excavation and ex-situ characterization of contaminated material; offsite disposal of soil (to a thermal desorption facility for Hazardous Waste material, or to a biotreatment facility for waste hydrocarbon soil, or to a landfill for all other soil); and collection, storage, treatment, and disposal of excavation and surface runoff water. Stage 1 of the remediation plan is now complete.

Parks Canada

Site Name: **Banff National Park** (Alberta)

FCSAAP expenditures to date	2004-2005
	\$554,064

This project contains three sites: Cougar Street, Saskatchewan Crossing Warden Station and Bankhead Rail Siding.

Cougar Street

Nature of contamination: This site is located in a Banff municipality residential neighbourhood and was contaminated with arsenic, barium, chromium, copper, lead, mercury, selenium, tin and zinc. Among those heavy metals, copper, lead and zinc were identified as the main contaminants of concern due their high concentrations. The contamination is believed to have come from an old dump that was used between 1901 and 1907 to dispose of ash, household refuse, cinders and other debris. Cinders were a source of fill material due to their abundance resulting from coal-fired locomotives and coal-fired furnaces in this area.

Work Completed Fiscal Year 2004-2005: Most of the remediation and land reclamation work was completed over a period of two months between June and August 2004. The remediation work involved excavating approximately 1,600 cubic metres of soil on eight residential properties on Cougar and Marten Streets in Banff. Extensive preparatory work was undertaken to facilitate the restoration of the site to its original landscaped condition once the excavation was completed. This included conducting structural building assessments prior to the commencement of site construction activities, additional delineation of areas of concern, taking photographs of the work area, landscape, and built features, as well as surveying the condition of property features, fence lines and any other site yard features (decks, shrubs, etc.) that may be impacted during the completion of the remediation work.

In total, 2,461 tonnes of heavy metal soils were removed, disposed of in a provincially certified landfill, and replaced with clean subsoil and topsoil. The site, covering eight residential properties, has now been fully reclaimed to its original pre-construction condition and/or better.

Saskatchewan Crossing Warden Station

Nature of contamination: In operation for over fifty years, the Saskatchewan Crossing Warden Station had accumulated a number of contamination problems. These included a leaking underground gasoline tank, spills from the aboveground gravity-feed gasoline and diesel tanks, a used oil dumping area, lead contamination at the shooting range and road salt contamination from a salt storage area.

Work Completed Fiscal Year 2004-2005: With funding from FCSAAP and the Kootenay/ Yoho/ Lake Louise National Park Field Unit (KYL Field Unit), a total of 492 tonnes of contaminated soil was excavated and removed from the site. This eliminated most of the contamination though there is potential contaminated groundwater in one of the six monitoring wells installed as part of the project.

The types and amounts of contaminated soil removed consist of 357 tonnes (gasoline), 60 tonnes (lead), 60 tonnes (diesel) and 15 tonnes (used oil).

The underground fuel tank had developed a pinhole leak on the bottom of the tank where the fuel measuring stick contacted the tank. The pinhole leak resulted in the excavation of 375 tonnes of soil down to a depth of nine metres. The tank had been out of operation for approximately ten years and removed four years earlier but the xylene levels were still so high that the soil qualified as hazardous waste. The xylene levels in the soil were reduced by using an aerating device that replaces the bucket on an excavator. Once the soil had been treated twice using the aerating device, the xylene levels were low enough that the soil could go to a regular landfill, thus reducing disposal costs by 50 percent.

The warden station area had been used as a shooting range for approximately 15 years. Testing showed that the gravel backstop had both high lead levels and high leachable lead values, primarily from the accumulation of shotgun slugs. The high leachate levels required one truck load of lead contaminated soil to be taken to a hazardous waste landfill.

To determine if there was any impact on groundwater, a total of six groundwater monitoring wells were installed. Groundwater was found at approximately 11 meters. One well had slightly elevated levels of polycyclic aromatic hydrocarbons (PAH's) and will require re-sampling.

Prior to the remediation project, a number of things were done to remove future sources of contamination. The gravity feed fuel tanks were replaced with double-walled tanks on concrete pads. The diesel generator was replaced with a propane generator to eliminate the need for a new fuel tank. The shooting range was closed and a proper steel shed was purchased to hold helicopter fuel being stored at the site.

There remains a small area of the Saskatchewan Crossing Warden Station impacted by road salt contamination due to road salt storage. This salt contaminated area will be addressed and remediated at a later date once a proper road salt storage method is determined and a proper storage shed is built.

Bankhead Rail Siding

Nature of contamination: Contaminants of concern include petroleum hydrocarbons, principally "coal tar" and PAH (benzo{a}pyrene).

Work Completed Fiscal Year 2004-2005: No work was completed on this site in 2004-2005.

Site Name: **Glacier National Park** (British Columbia)

FCSAAP expenditures to date

2004-2005
\$25,000

Nature of contamination: Potential contaminants of concern at the site include petroleum hydrocarbons, poly-aromatic hydrocarbons (PAH's), heavy metals, arsenic and ammonia. Results of the delineation work allowed to estimate the volume of soil exceeding park land use for petroleum hydrocarbon criteria at 3,600 m³ while the volume of soil exceeding industrial land use for petroleum hydrocarbon was estimated at 640 m³. Groundwater contamination was confirmed in the southeast corner of the site for petroleum hydrocarbon as well as for cobalt, iron and ammonia which exceeds CCME and/or the BC Ministry of Water Land and Air Protection Contaminated Sites Regulation guidelines and standards. While iron and cobalt concentrations may result from natural biodegradation of petroleum hydrocarbons, the source of ammonia remains uncertain.

Work Completed Fiscal Year 2004-2005: The delineation of subsurface contamination completed in 2004-2005 was part of the preparatory work for the remediation of soil contamination in 2005-2006. The goal was to provide with a refined estimate of the volume of the contaminated media at the southeast corner of the Rogers Pass Maintenance Compound where four buildings are located, including an administration building, a garage and two equipment/vehicle storage buildings. The possibility of contamination having impacted the adjacent Rogers Pass Creek, a habitat for Bull Trout, was also investigated in order to review the remediation work plan.

Results also suggest a possible migration of hydrocarbons from the confirmed area of contamination into the Rogers Pass Creek and possible contamination by the outfall drain. It is recommended that mitigation measures be developed to ensure that no sediment or groundwater is discharged into the creek during remediation work. It is also recommended that while contaminated soil can be excavated and transported to an off-site landfill, some hydrocarbon contaminated soil could be transported to a bio-cell unit within the national park and be monitored for at least one year. Once the source of hydrocarbon contamination for the groundwater has been removed, additional mini-piezometers should be installed along the banks of the Rogers Pass Creek to allow for seasonal monitoring of the water quality beneath the creek bed. Once the petroleum hydrocarbon-impacted soil has been removed, groundwater quality will improve with time but it may take several years to meet current aquatic freshwater quality standards.

Appendix 2: Federal Contaminated Sites Management Framework

Treasury Board Secretariat policies¹³ for the management of federal contaminated sites include:

- The *Federal Contaminated Sites Management Policy Framework* which requires federal custodians to:
 - Manage contaminated sites in a consistent and appropriate manner and address worst sites on a priority basis;
 - Use the National Classification System (NCS)—established by the Canadian Council of Ministers of the Environment (CCME) in 1992—to classify sites or equivalent;
 - Apply the CCME Environmental Quality Guidelines, and, where applicable, the Canada Wide Standards for Petroleum Hydrocarbons in Soil; and
 - Develop a “Contaminated Sites Management Plan” (to be updated annually).
- The *Policy on Accounting for Costs and Liabilities Related to Contaminated Sites* requires federal custodians to account for and report to TBS on the costs of all NCS Class 1 and 2 sites for which the department is liable or likely to be liable in the fiscal year that they are identified.
- The *Contaminated Sites and Solid Waste Landfills Inventory Policy* led to the development of the Federal Contaminated Sites Inventory (FCSI), which has been publicly available since July 2002, and as of March 31, 2005 contains information on over 4,000 federal contaminated sites. Information is provided to Treasury Board on the progress by federal custodians in remediation or risk-management of federal contaminated sites, and that information is captured in the FCSI.

¹³ More information on these policies can be found at http://www.tbs-sct.gc.ca/pubs_pol/dcgpubs/aas-gasa/index_e.asp

Appendix 3: FCSAAP Program Management Structure

■ Federal Contaminated Sites Steering Committee

Co-chaired by Environment Canada and TBS, this Assistant Deputy Minister level Steering Committee provides overall direction and accountability for the FCSAAP Program. The Committee includes representatives from all federal custodians with contaminated sites and the expert support departments.

The Committee oversees the implementation of the FCSAAP Program, and is responsible for setting program and project priorities, monitoring progress, and providing recommendations on the funding allocations for FCSAAP projects to the Deputy Minister of Environment and the Secretary of the TBS.

■ Contaminated Sites Management Working Group (CSMWG)

The CSMWG was originally established in 1995 to investigate and propose a common federal approach for the management of contaminated sites under federal custody and related issues. This working-level committee comprises all federal custodians with contaminated sites and includes representation from the expert support departments.

CSMWG has contributed to the development of procedures, tools, guidance and other key FCSAAP Program outputs, as well as reviewing the list of high-risk sites.

CSMWG sub-committees were used to develop processes related to the Program, including the ranking system, the RMAF, and the Canada-Wide Standards for Petroleum Hydrocarbons.

■ Federal Custodians

Federal custodians have direct responsibility for the contaminated sites under their control, including identifying sites and associated financial liabilities; prioritizing sites according to risk; developing a management plan; implementing assessment and risk-management or remediation activities; and ongoing monitoring.

Departments participating in FCSAAP have additional responsibilities with respect to highest-risk federal sites, which include: conducting screening-level risk assessments and preparing risk scores; preparing proposals for funding under FCSAAP and implementing approved projects; reporting on progress; and 'care and maintenance' of sites to prevent contaminant migration and further increases in federal financial liability.

■ FCSAAP Secretariat

The FCSAAP Secretariat is housed at the Contaminated Sites Division of Environment Canada in the National Capital Region. The Secretariat provides overall leadership and day-to-day management for the Program, in consultation with TBS and CSMWG, and reports directly to the Federal Contaminated Sites Steering Committee.

The Secretariat's functions include: establishing clear policy direction; providing the resources needed to achieve Program objectives; and coordinating the flow of data and information on Program requirements and results.

■ Treasury Board Secretariat

TBS has responsibility for developing federal policy related to contaminated sites management.

With respect to FCSAAP, the TBS role includes: reviewing financial aspects of project proposals and departments' reallocation capacity; administering the fund to ensure consistency with the policy framework; advising on the monitoring of government-wide progress and reporting results; and, seeking appropriate Treasury Board approvals. In addition, TBS co-chairs the ADM-level Steering Committee.

▪ **Expert Support Departments and Interdepartmental Regional Working Groups**

Health Canada, Fisheries and Oceans, and Environment Canada provide an expert support function to federal custodians, the Program Secretariat, and the FCS ADM Steering Committee. This role includes: provision of scientifically sound, nationally consistent advice on the highest-risk sites; review of risk assessments; and, review of risk-management/remediation plans for proposed projects.

These departments provide technical review of proposals, validate that eligible sites meet basic criteria and are subsequently prioritized according to the nature, severity and immediacy of the risk they pose to human health and the environment. They also score ecological and human health risks at the sites for which proposals have been submitted.

Interdepartmental Regional Working Groups (IRWGs) are in place in regions and subregions to advise custodians on the management of contaminated sites. The IRWGs provide custodians with access to the advice of expert support departments on compliance, health and ecological risks/impacts of contaminated sites and risk-assessment approaches as well as advice on the development of remediation/risk management plans for their sites, with priority given to those projects funded under the FCSAAP program. As of March 31, 2005:

- two IRWGs were established in the Atlantic Region;
- local IRWG meetings were held once in each of Yellowknife, Iqaluit, Winnipeg and Edmonton;
- a coordination meeting was held in Edmonton; and
- two IRWG meetings were held in the British Columbia Region.

IRWGs comprise staff from Expert Support departments and custodians with contaminated sites in the regions, and will provide advice and support in areas such as:

- Promoting regulatory compliance;
- Determining health and environmental impacts related to regional contaminated sites;
- Reviewing and determining the appropriateness of risk-assessment approaches; and,
- Assisting federal custodians with development of remediation, risk-management, and/or care-and-maintenance plans for highest-risk sites.

Appendix 4: FCSAAP Project Selection Methodology

The following list outlines the eligibility requirements for contaminated sites seeking remediation/risk-management or care-and-maintenance funding under the Program in 2004-2005, which remain unchanged from the 2003-04 criteria:

- The site must meet the definition of a contaminated site as stated in the TBS Federal Contaminated Sites Management Policy (a site at which substances occur at concentrations (1) above background levels and pose (or are likely to pose) an immediate or long-term risk to human health or the environment, or (2) exceeding levels specified in relevant policies or regulations.)
- The site must be listed in the Federal Contaminated Sites Inventory and subject to the TBS Federal Contaminated Sites Management Policy.
- The site must be identified as a Class 1 site under the Canadian Council of Ministers of the Environment (CCME) National Classification System (NCS) (CCME, 1992).
- The site must have total estimated multi-year remediation/risk-management or care-and-maintenance costs for a single property greater than or equal to \$ 1 million but not more than \$15 million per year (projects that fall outside these parameters could still be considered on an exception basis).
- The site must be included in the department's current Federal Contaminated Sites Management Plan.
- In the case of remediation/risk-management projects, the site must have completed Step 5 (Detailed Testing Program) of the Ten-Step Process for addressing a contaminated site as described in *A Federal Approach to Contaminated Sites* (CSMWG, 2000; refer to Annex 1); or, in the case of care and maintenance projects, the site must have completed Step 4 (Classification using the CCME National Classification System).
- The Program requires that departments contribute 30 percent of the cost of the project for the first \$25 million and ten percent for costs over \$25 million.

In 2004-2005, additional criteria were developed to ensure the effective distribution of resources among high-priority projects and that departments maintain their financial commitment to address their federal contaminated sites, including:

- Sites with a multi-year remediation/risk management costs totalling less than \$1 million may be considered for funding in exceptional circumstances, but the custodial department must demonstrate that there is a lack of alternative funding capacity.
- Departments with multiple small sites for which multi-year remediation/risk management costs for each project are less than \$1 million must submit each site as a separate remediation/risk management project.
- Sites containing unexploded ordnance (UXO) are eligible for assessment funding and may be eligible for remediation/risk management funding if the site meets the TB definition of a contaminated site.
- Funding allocations for assessment projects are based on priorities identified by each department.

Site-Ranking System Developed for Prioritization of 2004-2005 FCSAAP Project Submissions

Analysis of the project ranking system applied during the 2003-2004 selection process identified the need to develop a more scientifically defensible site ranking system that was based on nationally consistent methodologies of health and environmental risk assessment. This new ranking system was developed through a sub-committee of the CSMWG with the assistance of external consultants.

As in the first year of the program, sites were prioritized according to the nature, severity, and immediacy of the risk they posed to human health and safety and to the environment. It was decided that 2004-2005

projects would be ranked by a single score consisting of a weighted sum of Tier 1 (science-based) and Tier 2 (socio-economic) factors. The final weighting of Tier 1 to Tier 2 is 3:1.

Tier 1 considers risk-based, science factors which include:

- FCSAAP site classification system score (a system based on the CCME National Classification System for Contaminated Sites (NCS) but which uses a guidance document that was newly developed during 2003-04 to reduce variability and improve consistency);
- a Human Health Risk score derived by Health Canada;
- a Structural Engineering Failure Risk (developed primarily for care and maintenance projects where catastrophic failure of engineered structures such as dams and tailings ponds was an important consideration) and,
- an integrated Ecological Risk Evaluation Score.

Equal weighting is placed on each of the three risk scores in Tier 1. A final Tier 1 (risk) score for a maximum of 300 points is assigned to each site submitted for funding. Following the risk ranking under Tier 1, a Tier 2 score was developed. The Tier 2 score is based on non-scientific factors, including:

- Potential increase in financial liability due to inaction;
- Expected progress in remediation by March 2008;
- Legal considerations; and,
- Special considerations (impact on traditional lands and lifestyles).

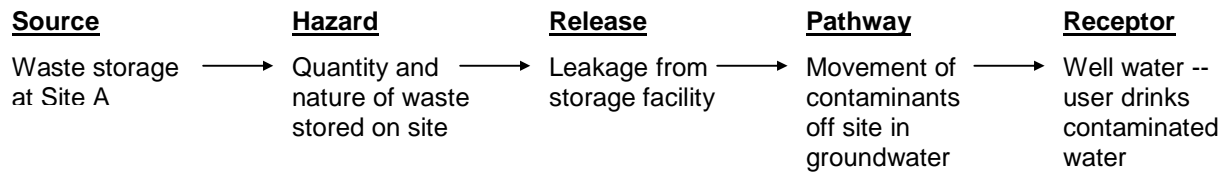
The Tier 2 score (maximum 100) was added to the Tier 1 score, for a maximum score of 400. A Priority List is then produced based on total score. Funding options are developed for projects on the Priority List from the top down and to the limit of available funding for the fiscal year in question. The list of highest risk sites will be updated from time to time and changes may occur in the relative ranking of sites from year to year as a result of progress in site remediation and management, the assessment of suspected sites, and changes in the ranking criteria and methodology.

Appendix 5: Evaluation of Human Health and Ecological Risks at Federal Contaminated Sites

The level of risk posed by a contaminated site can be evaluated based on three categories:

1. Contaminant characteristics – the relative hazard of contaminants present at a site.
2. Exposure pathways – the route a contaminant may follow (e.g., groundwater, surface water, direct contact, and/or air) to a receptor.
3. Receptors – living beings or resources that may be exposed to and affected by contamination (e.g., humans, plants, animals, or environmental resources).

The following figure illustrates an example of a chain of events from source to receptor:



Various types of information are analyzed before determining the level of risk posed by a contaminated site, including:

- Description of the site location;
- Type of contaminants or materials likely to be present at site (and/or description of historical activities);
- Approximate size of site and quantity of contaminants;
- Approximate depth of water table;
- Geologic map or survey information (soil, over-burden, and bedrock information);
- Annual rainfall data (can be inferred from rainfall map of Canada);
- Surface cover information;
- Proximity to surface water;
- Topographic information;
- Flood potential of site;
- Proximity of drinking water supply;
- Uses of adjacent water resources; and
- Land use information (on site and surrounding).¹⁴

As a result of the FCSAAP program, tools have been developed to assist federal custodians in evaluating the risks to both human health and the environment. To facilitate a standardized approach to calculating risks to human health resulting from federal contaminated sites, Health Canada developed the Preliminary Quantitative Risk Assessment tool (http://hc-sc.gc.ca/ewh-semt/contamsite/risk-risque_e.html). The Ecological Risk Evaluation Framework was developed as a tool to enable objective, transparent analysis of ecological risks associated with individual federal contaminated sites.

In conducting a human health risk assessment on federal contaminated sites, a number of factors are considered, including:

- Historical information to identify previous site uses and the possible contaminants to be investigated in soil and groundwater;
- Identification of contaminants of concern by comparing measured concentrations to regulatory guidelines;
- Identification of potential human exposure, which will vary depending on land use and the accessibility of the site;
- Examination of contaminant exposure pathways, that is, the ways in which the individuals will contact the contaminant (ingestion, inhalation, dermal contact) as well as an estimation of the movement of contaminants in the environment.

¹⁴ National Classification System for Contaminated Sites, Canadian Council of Ministers of the Environment, March 1992, http://www.ccme.ca/assets/pdf/ntnl_clsifctn_system_e.pdf

A Preliminary Quantitative Risk Assessment uses prescribed methods and assumptions, standard exposure pathways, human characteristics and levels of toxicity to ensure that exposures and risk are not underestimated. When combined with site-specific information, this model helps in the assessment of toxicity and hazard associated with exposure to various chemicals.

The ecological risk evaluation assesses contaminated sites to determine:

- If the contaminated area is affecting or has the potential of affecting specific habitat(s);
- The types of chemicals found at the site and the degree to which individual chemicals exceed environmental guidelines;
- How the chemical(s) are finding their way into the environment; and
- Any physical (non-chemical) impacts or hazards that may affect the quality of the environment or pose a risk to humans or wildlife.

For more details on the Preliminary Quantitative Risk Assessment, visit the Health Canada web site: http://hc-sc.gc.ca/ewh-semt/pubs/contamsite/index_e.html

Appendix 6: Expenditure Tables

a: Program Expenditures

	Planned FCSAAP Expenditures	Actual FCSAAP Expenditures
Federal Contaminated Sites Projects		
Indian and Northern Affairs Canada (INAC)		
<i>INAC (Northern Program)</i>	45,331,784	45,331,784
<i>INAC (Indian and Inuit Affairs Business Line)</i>	2,030,000	2,624,767
Total INAC	47,361,784	47,956,551
National Defence	23,096,263	23,096,263
Fisheries and Oceans	1,277,200	1,222,793
Health Canada ^a	1,820,000	1,636,772
Environment Canada	3,952,463	1,314,967
Royal Canadian Mounted Police ^b	313,425	386,826
Canadian Food Inspection Agency	100,450	100,450
Transport Canada ^c	10,021,690	7,035,496
Canada Border Services Agency	42,000	36,203
Correctional Service Canada	367,500	179,634
Natural Resources	133,000	100,186
Agriculture and Agri-Food Canada	230,475	230,475
Parks Canada	883,750	863,894
Total Project Expenditures	89,600,000	84,160,510
Secretariat and Expert Support Services ^d		
Environment Canada		
<i>EC Secretariat</i>	2,423,341	2,057,391
<i>EC Expert Support</i>	1,748,376	815,920
Total EC Secretariat/Expert Support	4,171,717	2,873,311
Health Canada Expert Support	3,845,300	3,845,300
DFO Expert Support	1,890,800	1,264,258
PWGSC Accommodation costs	492,183	492,183
Total Secretariat and Expert Support	10,400,000	8,475,052
Total FCSAAP Expenditures	100,000,000	92,635,562

^a Health Canada reprofiled FCSAAP funds in the amount of \$121,100 from fiscal year 2003-2004 to 2004-2005

^b RCMP reprofiled FCSAAP funds in the amount of \$105,422 from fiscal year 2003-2004 to 2004-2005

^c Although Transport Canada received authority to request \$2.415M for the Newfoundland Dockyard project, the department did not request 2004-2005 funding due to delays in reaching an agreement with regulatory authorities

^d Totals include Employee Benefits Plan contributions.

b: Detailed FCSAAP and Custodian Expenditures

Federal Contaminated Sites Projects	Planned FCSAAP Funding		Adjustments ^a	Actual FCSAAP Expenditures		FCSAAP Variance
	FCSAAP Fund	Department Share		FCSAAP Fund	Department Share	planned - actual
INAC (Northern Program)						
Clinton Creek Mine (YU)	1,660,400	711,600		799,958	342,839	860,442
Colomac Mine (NWT)	8,331,100	3,147,900		8,331,100	2,515,017	0
Discovery (NWT)	1,036,000	444,000		2,553,046	1,094,419	-1,517,046
Fox C - Ekalugad Fiord (NU)	194,600	83,400		1,051,861	450,798	-857,261
Faro Mine (YU)	11,163,700	3,729,300		10,677,518	3,567,240	486,182
Giant Mine (NWT)	7,070,000	3,030,000		6,787,402	2,908,886	282,598
Mount Nansen Mine (YU)	1,134,000	486,000		932,180	399,506	201,820
Port Radium Mine (NWT)	1,204,000	516,000		1,301,589	557,824	-97,589
Resolution Island (NU)	7,002,800	3,001,200		7,154,394	3,066,169	-151,594
CAM F - Sarcpa Lake (NU)	1,844,500	790,500		912,229	390,956	932,271
Silver Bear Mines (NWT)	731,500	313,500		791,239	339,103	-59,739
Tundra-Taurcanis Mine (NWT)	781,550	334,950		1,207,804	567,974	-426,254
United Keno Hill Mine (YU)	2,982,700	1,278,300		2,636,530	1,129,941	346,170
FCS Assessments (11)	194,934	83,543		194,934	103,732	0
Sub-total INAC-NAP	45,331,784	17,950,193		45,331,784	17,434,404	0
INAC (IIABL)						
Barren Lands (MB)	1,190,000	510,000	882,887 ^b	2,072,887	510,000	0
Oxford House (MB)	840,000	360,000		551,880	236,520	288,120
Sub-total INAC-IIABL	2,030,000	870,000		2,624,767	746,520	288,120
Total INAC	47,361,784	18,820,193		47,956,551	18,180,924	288,120

^a Adjustments include in-year transfers of funds from one custodian to another and the transfer of funds from the previous fiscal year.

^b Adjustment made for funds received from Environment Canada by another custodian.

b: Detailed FCSAAP and Custodian Expenditures, continued

Federal Contaminated Sites Projects	Planned FCSAAP Funding		Adjustments ^a	Actual FCSAAP Expenditures		FCSAAP Variance
	FCSAAP Fund	Department Share		FCSAAP Fund	Department Share	planned - actual
National Defence						
14 Wing Greenwood (NS)	855,400	366,600		558,259	239,254	297,141
5 Wing Goose Bay - Survival Tank Farm (NFLD)	547,250	300,000		128,412	55,034	418,838
5 Wing Goose Bay - Upper Tank Farm (NFLD)	630,000	270,000		358,337	153,573	271,663
CAM 2 Gladman Point (NU)	0	0		3,243,387	1,708,326	-3,243,387
Colwood Aggregate (BC)	840,000	360,000		1,222,798	524,056	-382,798
DYE-M Cape Dyer (NU)	2,660,000	1,140,000		4,189,678	1,795,576	-1,529,678
FOX-M Hall Beach (NU)	5,040,000	2,160,000		3,474,404	1,489,030	1,565,596
Harvey Barracks (AB)	910,000	390,000		1,971,511	844,933	-1,061,511
PIN-4 Byron Bay (NU)	588,000	252,000		47,597	20,399	540,403
Saglek PCB (NFLD)	5,740,000	2,460,000		5,495,000	2,355,000	245,000
Suffield EPG (AB)	3,045,000	1,305,000		500,868	214,658	2,544,132
TCE Valcartier (QC)	1,855,000	795,000		1,520,400	651,600	334,600
FCS Assessments (2)	385,613	165,263		385,613	721,712	0
Total National Defence	23,096,263	9,963,863		23,096,263	10,773,151	0
Fisheries and Oceans						
SCH Belleville (ON)	210,000	90,000		175,000	84,568	35,000
Lighthouses (BC)	67,200	28,800		67,200	28,800	0
FCS Assessments (237)	1,000,000	428,571		980,593	514,195	19,407
Total Fisheries and Oceans	1,277,200	547,371		1,222,793	627,563	54,407
Health Canada						
Kasabonika (ON)	420,000	180,000		448,980	192,429	-28,980
Lansdowne House (ON)	420,000	180,000		244,800	0	175,200
Weagamow Lake (ON)	980,000	420,000		942,992	235,748	37,008
Total Health Canada	1,820,000	780,000	121,110 ^d	1,636,772	428,177	304,338

^a Adjustments include in-year transfers of funds from one custodian to another and the transfer of funds from the previous fiscal year.

^d Funds transferred from fiscal year 2003-2004.

b: Detailed FCSAAP and Custodian Expenditures, continued

Federal Contaminated Sites Projects	Planned FCSAAP Funding		Adjustments ^a	Actual FCSAAP Expenditures		FCSAAP Variance planned - actual
	FCSAAP Fund	Department Share		FCSAAP Fund	Department Share	
Environment Canada						
PEC (BC)	3,150,000	1,350,000	-907,887 ^c	512,504	601,467	1,729,609
Assessments (10)	802,463	343,913		802,463	788,305	0
Total Environment Canada	3,952,463	1,693,913		1,314,967	1,389,772	1,729,609
Parks Canada						
Banff National Park (AB)	580,300	248,700		554,064	237,456	26,236
Glacier National Park (BC)	0	0	25,000 ^b	25,000	21,722	0
FCS Assessments (14)	303,450	130,050		284,830	258,843	18,620
Total Parks Canada	883,750	378,750		863,894	518,021	44,856
Transport Canada						
Former Remote Radar Site 59 (NFLD)	2,100,000	900,000		2,100,000	809,100	0
Newfoundland Dockyard (NFLD)	2,415,000	1,035,000		0	0	See note below ^f
Rock Bay (BC)	4,900,000	2,100,000		4,451,509	1,907,789	448,491
FCS Assessments (14)	606,690	260,010		483,987	282,442	122,703
Total Transport Canada	10,021,690	4,295,010		7,035,496	2,999,331	571,194

^a Adjustments include in-year transfers of funds from one custodian to another and the transfer of funds from the previous fiscal year.

^b Adjustment made for funds received from Environment Canada by another custodian.

^c Adjustment made for funds transferred from Environment Canada to another custodian.

^f Although Transport Canada received authority to request \$2.415M for the Newfoundland Dockyard project, the department did not request the funds or carry out any work on the project in 2004-2005 due to delays in reaching an agreement with regulatory authorities.

b: Detailed FCSAAP and Custodian Expenditures, continued

Federal Contaminated Sites Projects	Planned FCSAAP Funding		Adjustments ^a	Actual FCSAAP Expenditures		FCSAAP Variance planned - actual
	FCSAAP Fund	Department Share		FCSAAP Fund	Department Share	
Additional FCS Assessments						
Agriculture and Agri-Food Canada (10)	230,475	98,775		230,475	102,425	0
Canada Border Services Agency (4)	42,000	18,000		36,203	15,516	5,797
Canadian Food Inspection Agency (10)	100,450	43,050		100,450	83,717	0
Correctional Service Canada (4)	367,500	157,500		179,634	76,986	187,866
Natural Resources (2)	133,000	57,000	-24,500 ^e	100,186	42,937	8,314
Royal Canadian Mounted Police (51)	313,425	134,325	105,422 ^d	386,826	168,557	32,021
Sub-total Additional Assessments	1,186,850	508,650		1,033,774	490,138	233,998
Remediation total	50,229,050	21,592,200	121,110	45,277,539	19,382,785	2,657,621
Care and maintenance total	34,890,950	13,475,550	0	34,716,777	12,864,925	174,173
Total Remediation/Care and Maintenance/Risk Management Projects	85,120,000	35,067,750	121,110	79,994,316	32,247,710	2,831,794
Total Assessments	4,480,000	1,920,000	80,922	4,166,194	3,159,367	394,728
TOTAL	89,600,000	36,987,750	80,922	84,160,510	35,407,077	3,226,522

^a Adjustments include in-year transfers of funds from one custodian to another and the transfer of funds from the previous fiscal year.

^d Funds transferred from fiscal year 2003-2004.

^e Funds returned to FCSAAP