

Canadian Forces College des Forces Canadiennes



DND CONTAMINATED SITES POLICY

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JCSP 45 - Solo Flight

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DND Contaminated Sites Policy

At the end of the day, Canadians should focus on the environmental problems we are trying to solve, and design policy instruments that address each problem individually.

- J. Winter, Environmental Policy Transformations and Canada at 150

Contaminated sites, whether they be legacy from an era when the environmental impact was not well known, or when no one really cared, and the identification of emerging contaminants continue to be an issue for the Department of National Defence (DND). These sites bring with them an associated financial liability that DND must carry until effective remediation strategies are found. According to the Federal Contaminated Sites Inventory (FCSI), DND is currently responsible for 793 active sites and another 159 suspected sites¹ which are "...scattered across the country, from Goose Bay in Newfoundland and Labrador, to Valcartier, Que., and the British Columbia interior...."2 As noted by Panagiotakis and Dermatas, "Soil and groundwater contamination is one of the most complex environmental problems faced nowadays...."³ In some cases, known contaminants have no known remediation technology that is effective at cleaning an impacted site. On the other hand, some known technologies are costly, stretching tight budgets, and can be difficult to access due to their limited availability and/or distance from the contaminated site. Under these circumstances robust contaminated sites policies are necessary in order to effectively manage the liability and risk, as well as contribute to good environmental stewardship.

¹ Federal Contaminated Sites Inventory. <u>https://www.tbs-sct.gc.ca/fcsi-rscf/oob-oodg-eng.aspx</u>

² John Ward, "Cost of Cleaning Contaminated Military Sites Estimated at almost \$450 Million." *Canadian Press NewsWire*, Jun 23, 2006.

³I. Panagiotakis and D. Dermatas, "Contaminated Site Management and Remediation Technologies." *Bulletin of Environmental Contamination and Toxicology* 101, no. 6 (12, 2018): 691.

DND has the organizational structure and available federal funding mechanisms to implement and sustain a robust contaminated sites program, what it lacks is a clear, department specific policy to guide it long-term. To aid in the discussion, this paper will first give a brief background on what contaminated sites are and the various defence activities that caused and/or can cause them, in order to understand why one must be concerned. Then there will be a review of DNDs current organizational structure related to contaminated sites management, existing environmental policies (federal and departmental) and available funding mechanisms. Finally, to further demonstrate the need for a dedicated policy, this paper will examine the problem of emerging contaminants and why DND needs to maintain constant vigilance.

In order to appreciate the importance of having a dedicated contaminated sites policy one must understand what contaminated sites are, their causes and potential impacts both on the environment and to human health. Firstly, the Canadian Council of Ministers of the Environment (CCME) defines contaminated sites as:

 \dots a location at which soils, sediments, wastes, groundwater and surface water are contaminated by substances that are above benchmark criteria and/or that pose an existing or imminent threat to human health or the environment.⁴

Activities that can cause contamination are varied and normally accidental in nature. Legacy sites, such as those in the Arctic, were caused by "... decades of neglect, or date back to a time when little thought was given to long-term environmental consequences."⁵

⁴ Canada. Canadian Council of Ministers of the Environment. *Guidance Document on the Management of Contaminated Sites in Canada (PN 1279)*. (Winnipeg: Manitoba Statutory Publications, 1997), 1.

⁵ John Ward, "Cost of Cleaning Contaminated Military Sites Estimated at almost \$450 Million." *Canadian Press NewsWire*, Jun 23, 2006.

Now the onus is on the property's custodian to remediate and restore the site, reducing the overall risk to both the surrounding environment and human health. So why should DND be concerned? Even if every precaution is taken, it is important to note that almost any activity that DND engages in to conduct its daily mission has the potential to have a negative environmental impact. Defence activities such as armed conflict, training, operations, and even day-to-day support tasks where "...[equipment] maintenance leads to the generation of large quantities of hazardous wastes..."⁶ have the potential to negatively affect the environment if those hazardous materials are not disposed of properly. Another example, used extensively in live-fire training and not given much thought, are the bullets used, which left out in the natural elements will eventually break down leading to the possibility of "... contamination of soils, groundwater, and surface water sources."7 Though, in the case of armed conflict, "...battlefield supremacy and achieving military objectives will likely continue to trump any and all concerns related to the environment..."⁸ until the conflict has ceased and normal policies can be enforced. It is the commander on the ground that must accept the risk and prepare for remediation of any resulting contamination in the period of peace and within reason.

As noted in the introduction, DND, as one of the largest government departments, is currently responsible for 952 contaminated sites, 159 suspected and 793 active, across its real property portfolio. The Federal Contaminated Sites Action Plan (FCSAP) annual report for 2016 to 2017, published in 2018, detailed DNDs financial liability for those

⁶ Lawrence, Michael J., Holly L. J. Stemberger, Aaron J. Zolderdo, Daniel P. Struthers, and Steven J. Cooke. "The Effects of Modern War and Military Activities on Biodiversity and the Environment." *NRC Research Press* 23, no. 4 (2015): 448.

⁷ Ibid., 449.

⁸ Ibid., 454.

sites sits at an estimated \$536,639,813, an increase of over \$17 million over the previous reporting period (2015 to 2016).⁹ This does not include the department's moral liability for associated risks to human health and the surrounding environment. A financial liability this large, which is expected to endure over several years, if not decades, requires a clear, stand-alone policy dedicated to its management and planned reduction.

As noted above, DND already has the appropriate organizational structure, from the strategic down to the tactical level, in order to properly implement and support a robust environmental program. Logically, this should translate into a strong backbone to support the creation of a clear contaminated sites policy in order to effectively manage that program while continuing to reduce DND's associated financial liability. At the top of the chain of command, is the Assistant Deputy Minister (Infrastructure and Environment) (ADM(IE)) who, as the name implies, is responsible and accountable for the management of real property and environment related activities, which includes contaminated sites management, within DND. Within ADM(IE), it is the Director General Environment and Sustainable Development (DGESM) who manages the Director of Contaminated Sites (DCS). The role of the DCS is to "...direct all activities related to Contaminated Sites Management..."¹⁰ and includes the "...the establish[ment] and mainten[ance of] DND standards, guidelines, tools, project management processes and procedures for contaminated sites management..."¹¹

⁹ Canada. Environment and Climate Change Canada. *Federal Contaminated Sites Action Plan: Annual Report 2016 to 2017*. (Gatineau, 2018): 80.

¹⁰ ADM (IE) Contaminated Sites and UXO Legacy Sites.

http://intranet.mil.ca/en/infrastructure-environment/environment/contaminated-sites.page

¹¹ National Defence. Assistant Deputy Minister (Infrastructure and Environment). *ADM(IE) Standard on the Management of Contaminated Sites*, v1.0. (1 May 2019): 11.

Moving down to the tactical level are the Wing and Base Environmental Officers (W/B Env Os) who, under a Partnership Agreement between the various L1s (i.e. Army, Navy and Air Force) and ADM(IE), are responsible for designating contaminated site managers and contaminated site coordinators for the respective areas of responsibility. They can decide to take on the responsibility themselves, or must designate someone within the unit to act in that capacity if there is enough personnel depth available. Finally, there is the Director, Infrastructure and Environment Comptrollership (DIEC) who is "…responsible for ensuring that accounting and reporting requirements related to environmental liabilities are met."¹²

It is important to note, that in the normal course of their day-to-day activities W/B Env Os do not report directly through the ADM(IE) chain on other environmental matters, despite what the position names would suggest. A remnant of the transformation and centralization of Real Property under the Real Property Operations Group (RPOG) within ADM(IE), Environment Officers were left in their respective L1 organizations, and service level agreements were drafted so they could continue to provide support to Real Property Operations Units (RPOUs) in an advisory capacity. While it would seem to make more sense to amalgamate all IE functions under one umbrella, that is not the case within DND, and is a discussion better left for another paper.

Now that the organizational structure has been discussed, the next step is to discuss current contaminated sites funding practices. There are two funding mechanisms available for DND to use in the remediation and management of contaminated sites, one

¹² Ibid., 13.

is a federal program open to all departments (FCSAP) and the other departmentally derived (C167). This paper will only discuss FCSAP funding, since it is only used in the remediation and assessment of contaminated sites, unlike C167 funding which can be used for a number of environmental program related items. Originally established by the Canadian Government in 2005, FCSAP was a "...15-year program with funding of \$4.54 billion."¹³ In 2019, in advance of the 2020 end date, the FCSAP was renewed for "...another 15 years (2020 to 2034) with \$1.16 billion announced...for the first 5 years (Ph IV, 2020 to 2024)."¹⁴ The program's objectives are to "...reduce the human health and environmental risks posed by federal contaminated sites..."¹⁵ and to ultimately reduce the financial liability for not only the departmental site custodian but the federal government as a whole. There is a cost share aspect to the program where 80% of assessments and 85% of remediation costs are covered by FCSAP for sites under \$90 million. If costs are over \$90 million then the full remediation amount of the site will be covered by FCSAP.

The program has seen some success since it was established "…restor[ing] nearly 17,000 sites across the country…"¹⁶ by early 2020. This funding mechanism is well known and used by DND to fund the remediation and assessment of its known sites, taking advantage in times when budgets are stretched just getting mission essential tasks completed. For the period of the recently renewed (i.e. Ph IV), DND has 210 identified sites set for assessment, remediation or both in the first five year period, spanning across

¹³ Action Plan for Contaminated Sites.

 $https://www.canada.ca/en/environment-climate-change/services/federal-contaminated-sites/action-plan.html \ ^{14}\ Ibid.$

¹⁵ Rob Lindsay. "Understanding FCSAP." HazMat Management 22, no. 1 (Winter, 2010): 19.

¹⁶Grant Cameron,. "Taking Action to Tackle Canada's Contaminated Sites." *Daily Commercial News*. April 23, 2020.

the country and encompass sites classified as either Class 1, "...High Priority for Action..."¹⁷, and Class 2, "...Medium Priority for Action."¹⁸ There are other classifications levels for action but emphasis is put on sites with high and medium priority for action within the FCSAP program. The other sites can be remediated using local C167 funds or risk managed until federal funding becomes available.

Next, a review of both federal and departmental policies, directions and standards that exist will be conducted. A thorough review will show that, while there is sufficient federal direction, overarching department documents, save one drafted and implemented by ADM(IE), pay scant attention to contaminated sites management and rather focus on the challenges of the day, like climate change and energy management. The Treasury Board published the *Policy on Management of Real Property*, with the objective to "…ensure real property is managed in a sustainable and financially responsible manner, throughout its life cycle, to support the cost-effective and efficient delivery of government programs."¹⁹ It also outlines the responsibilities of Deputy Heads citing the responsibility to manage real property in an "…environmentally responsible manner…."²⁰ With respect to contaminated sites, they must ensure that they are "…assessed and classified and risk management principles applied to determine the most appropriate and cost-effective course of action for each site."²¹ Finally, the expectation is that the policy, along with the associated directives and standards, results in the "…effective and efficient

 ¹⁷ Canada. Canadian Council of Ministers of the Environment. National Classification System for Contaminated Sites: Guidance Document (PN 1403). (Winnipeg, 2008): 2.
¹⁸ Ibid., 2.

 ¹⁹ Policy on Management of Real Property. <u>https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=12042</u>
²⁰ Ibid.

²¹ Ibid.

management that enables program outcomes and serves broader government objectives....²²

Environment and Climate Change Canada (ECCC) has developed guidance, *A Federal Approach to Contaminated Sites*, that provides clear and consistent direction on the management of contaminated sites found within the federal portfolio. The document was "...developed by the Contaminated Sites Management Working Group (CSMWG) to provide a common federal approach to managing contaminated sites under federal custody."²³ The CSMWG developed a policy that "Contaminated sites on federal lands shall be identified, classified, managed and recorded in a consistent manner."²⁴

When reviewing DND related documentation, specifically *Strong, Secure, Engaged: Canada's Defence Policy* (SSE) and the *Defence Energy and Environment Strategy* (DEES), there is relatively little concerning contaminated sites management compared with other emerging environmental issues, such as energy management and the climate change crisis. *Strong, Secure, Engaged* provides a passing mention of contaminated sites, stating that the department will continue to "…remediat[e] sites formerly contaminated by military activities and work is ongoing to proactively mitigate the environmental impacts of military activities going forward."²⁵ The statement is buried in Chapter 6 under the section Greening Defence, with no set goals or targets for the department to follow. Nothing else can be found in the remainder of the document, which

 ²² Policy on Management of Real Property. https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=12042
²³ Federal approach to contaminated sites.

https://www.canada.ca/en/environment-climate-change/services/federal-contaminated-sites/federal-approac h.html

²⁴ Ibid.

²⁵ Canada. Minister of National Defence. *Strong Secure Engaged: Canada's Defence Policy*. (Ottawa, 2017): 75.

is concerning considering this is the overarching Canadian Defence policy that will carry the department through the next few years, at least. The DEES document is not much better, providing a single target under the Sustainable Operations chapter, to "Reduce DND's contaminated sites liability by an average of 7% per year by 2020."²⁶ Unfortunately, it is now 2020, with no update provided or any indication that DND was able to meet its target. What it does provide, though brief, is further direction that department is to:

...[manage] its contaminated sites in a manner that is consistent with Treasury Board policy, prioritizing its sites based on human health and environmental risks using approved criteria, developing and implementing management strategies for proposed projects, executing projects and reporting on results.²⁷

The strategy also directs that the department will "...continue to leverage the Federal Contaminated Sites Action Plan to clean up contaminated sites in order to reduce its environmental liability related to real property."²⁸ This lack of detailed mention in both documents, could be seen as a minimization of importance of contaminated sites management in comparison to other Greening defence issues, which are no less important but should not overshadow the necessity of contaminated sites management.

The standard produced by DCS, *ADM(IE) Standard on the Management of Contaminated Sites,* whose goal is to "…promote consistent management decisions related to the Department's portfolio of contaminated sites…"²⁹, would provide a good

²⁶ Defence Energy and Environment Strategy. Harnessing energy efficiency and sustainability: Defence and the road to the future.

https://www.canada.ca/en/department-national-defence/corporate/reports-publications/dees.html ²⁷ Ibid.

²⁸ Ibid.

²⁹ National Defence. Assistant Deputy Minister (Infrastructure and Environment). *ADM(IE) Standard on the Management of Contaminated Sites*, v1.0. (1 May 2019): 2.

basis for the development of a robust contaminated sites policy, in conjunction with the direction provided by both the TB and ECCC documents.

To further highlight the necessity for a long-term contaminated sites policy, this paper will not examine the problem and risks posed by emerging contaminants. An emerging contaminant can be defined as "...unregulated or not completely regulated compounds, which have significant adverse effects on human health and the surroundings ..."³⁰ and can be "...naturally occurring, manufactured or manmade chemicals or materials...."³¹ There are many instances in history where chemicals or materials once considered safe and widely used have been proven to be the opposite, such as asbestos and polychlorinated biphenyls (PCBs), and are now heavily regulated, if not outright banned. A concern with these type of contaminants is the initial widespread use and belief that they are relatively safe with little regulation for use. Then several years in the future, scientific research finds that these materials are found to have severe negative human health and environmental impacts. Almost immediately there is an increase to an organization's environmental financial liability and the waiting begins for science to develop effective methods for remediation and destruction.

An example of an emerging contaminant that DND is currently dealing with are per- and polyfluoroalkyl substances (PFAS), a "...family of chemicals known for their non-stick, water-repellent and stain-resistant properties...."³² PFAS was first synthezied

³⁰ Muhammad Bilal, Muhammad Adeel, Tahir Rasheed, Yuping Zhao, and Hafiz M.N. Iqbal, "Emerging Contaminants of High Concern and Their Enzyme-Assisted Biodegradation - A Review." *Environment International* 124, (2019): 338.

³¹ Sébastien Sauvé and Mélanie Desrosiers, "A Review of what is an Emerging Contaminant." *Chemistry Central Journal* 8, no. 1 (2014): 7.

³² Johnathan Van Hamme, . "A Blanket Ban on Toxic 'Forever Chemicals' is Good for People and Animals." *The Canadian Press*, Feb 07, 2020.

in 1934 and then further developed by DuPont who "...commercialized [it] as the non-stick coating Teflon...³³ and were subsequently used in a variety of other applications. What makes PFAS ideal for such widespread use is also what makes it a concern, they are "...known to be extremely persistent in the environment and accumulate in the body... linked to adverse health impacts such as cancer, lover damage, infertility, and thyroid disease...."³⁴ For DND, it is PFAS' use in Aqueous Film Forming Foam (AFFF), a fire suppression agent used by department firefighters in both real time and in training, that has caused contamination at multiple locations. These sites are registered in the FCSI and consist mainly of old Firefighter Training Areas (FFTA), though 19 Wing Comox proper is registered as one site. Incineration of contaminated material is the only current, proven technology that can be used for site remediation programs but it is not cost effective or widely available across the country and, therefore, not an ideal remediation option for DND's more rural properties. There is hope, in 2019 the Real Property Institute of Canada hosted a Federal Contaminated Sites Regional workshop that focussed on PFAS and other emerging contaminates. Many new and innovative remediation technologies were presented and though they were in the early research stages they showed the promise to develop into more cost effective solutions over the next 10 years or more. Consequently, for PFAS contamination, DND must continue risk managing these sites until a more ideal remedial solution is found, and a policy to ensure that these sites and others are not forgotten in the fervor over climate change and energy management needs to be in place.

³³ Ibid.

³⁴ Elaine Burridge, "The PFAS Priority." ICIS Chemical Business 43, no. 3 (2019): 18.

As demonstrated in this paper, it is clear that DND needs a department-specific contaminated sites policy, in line with existing TB and ECCC policy but task-tailored to the department's unique mission. The foundation provided in part by the ADM(IE) Standard on the Management of Contaminated Sites, exists to develop an effective, clear policy that will survive in the long-term as the department continues to deal with its legacy sites, new sites, and the specter of emerging contaminants. What is also clear, despite having the organization and funding mechanisms in place, without a leadership supported policy in place, contaminated site issues have the potential to be overshadowed by an stronger emphasis on energy management and the climate change crisis. While those issues are important and the department must do its part as a part of good environmental stewardship, contaminated sites management must not be forgotten. These sites will continue to be a large financial liability for DND in both the near and long term with the potential to negatively affect the ecosystem and impact human health, whether it be its own members or the general public. Ongoing identification of emerging contaminants will more or less guarantee the continued existence of contaminated sites as scientific research identifies toxic and harmful materials once deemed safe for use much like asbestos and PCBs over the last 20 years and, most recently, PFAS. As a result, a comprehensive and robust contaminated sites management policy must be developed that clearly identifies the department's path to reduce and manage the liability of identified and unknown contaminated sites across its real property portfolio. Unfortunately, DND may never be able to clean every known site because no remediation technology exists that can effectively remove the contaminant, as is the case with PFAS contamination that

exists at many FFTAs. Additionally, legacy sites will continue to plague DND as more and more sites are identified as a result of historical practices. Developing a department specific contaminated sites policy is essential to meet the needs of DND as it continues to risk manage sites until remediation solutions are found, legacy sites are cleared, liability is zeroed, and greening government initiatives ensure that no further contamination is possible.

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