Government of Canada / Gouvernement du Canada

Canada

Federal Contaminated Sites Action Plan (FCSAP)

Supplemental Guidance for the Scoring of Sites Using the National Classification System for Contaminated Sites (NCSCS) and Aquatic Sites Classification System (ASCS) under the Federal Contaminated Sites Action Plan

Final Version
May 23, 2013

LIBRARY AND ARCHIVES CANADA CATALOGUING IN PUBLICATION

Supplemental Guidance for the Scoring of Sites Using the National Classification System for Contaminated Sites (NCSCS) and Aquatic Sites Classification System (ASCS) under the Federal Contaminated Sites Action Plan

Issued also in French under title:

Document d'orientation supplémentaire pour la cotation des sites à l'aide du Système national de classification des lieux contaminés (SNCLC) et du Système de classification des sites aquatiques (SCSA), dans le cadre du Plan d'action pour les sites contaminés fédéraux

ISBN no. 978-1-100-22656-9

Cat. no. En14-103/2013E-PDF

DISCLAIMER

Her Majesty is not responsible for the accuracy or completeness of the information contained in the reproduced material. Her Majesty shall at all times be indemnified and held harmless against any and all claims whatsoever arising out of negligence or other fault in the use of the information contained in this publication or product.

The information in this document does not constitute legal advice; following this guidance will not necessarily ensure compliance with federal, provincial, or any other regulatory requirements. In case of discrepancy between this information and any Acts of Parliament, most notably the *Canadian Environmental Protection Act, 1999* or the *Fisheries Act* or regulations made under these Acts, the Acts of Parliament and associated regulations take precedence. Notwithstanding any other regulatory or permitting requirements, any deposits, discharges and releases from your operations or activities must comply with all applicable federal Acts and regulations.

COPYRIGHT

Table of Contents

Introduction

This supplemental guidance document was developed with the objective to improve the overall National Classification System for Contaminated Sites (NCSCS) and Aquatic Sites Classification System (ASCS) score reliability and to further reduce areas of subjectivity in current guidance. It is intended for the use of custodians of federal contaminated sites and their consultants. This guidance will be an evergreen document that will be updated as needed and that was developed specifically for the operational requirements of the Federal Contaminated Sites Action Plan (FCSAP).

Consultants completing a NCSCS and/or ASCS score on behalf of a custodian should utilize the existing Canadian Council of Ministers of the Environment (CCME, 2008b) NCSCS guidance document, the FCSAP ASCS (2012) Detailed User Guidance Manual, the guidance in the NCSCS (version 1.2; 2010) and ASCS (2012) worksheets and this additional guidance to avoid causing any delay to the site eligibility review process. Custodians should attach this guidance document or provide a web link in the terms of references when developing a request for proposal that requires NCSCS and/or ASCS scoring.

This guidance document does not create any new requirements or remove existing requirements from the 2008 NCSCS and the FCSAP 2009 ASCS but provides additional guidance from FCSAP Expert Support (ES) in order to reduce uncertainties and improve consistency and efficiency related to site eligibility review.

If you have any questions related to this supplemental guidance document or with the NCSCS or ASCS process in general, please contact your FCSAP regional Environment Canada (EC) ES coordinator (contact the FCSAP Secretariat, FCSAP.PASCF@ec.gc.ca, for regional contact information). A training video is available by contacting the FCSAP Secretariat (FCSAP.PASCF@ec.gc.ca).

List of acronyms

ASCS	Aquatic Site Classification System
CCME	Canadian Council of Ministers of the Environment
CEQG	Canadian Environmental Quality Guidelines
COPC	Contaminant of Potential Concern
CSM	Conceptual Site Model
CWS	Canada Wide Standard
DNAPL	Dense Non-Aqueous Phase Liquid
DQRA	Detailed Quantitative Risk Assessment
EC	Environment Canada
EDI	Estimated Daily Intake
ES	Expert Support
ESA	Environmental Site Assessment
FCSAP	Federal Contaminated Sites Action Plan
FCSI	Federal Contaminated Sites Inventory
FIGQG	Federal Interim Groundwater Quality Guideline
HHERA	Human Health and Ecological Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
IDEA	Interdepartmental Database for Exchange Application
ILCR	Incremental Life time Cancer Risk
LNAPL	Light Non-Aqueous Phase Liquid
NCSCS	National Classification System for Contaminated Sites
PHC	Petroleum Hydrocarbons
PIN	Parcel Identifier Number
PSP	Paralytic Shellfish Poisoning
R/RM	Remediation/Risk Management
SSRA	Site Specific Risk Assessment
US EPA	United States Environmental Protection Agency

1) Level of available information

1.1) When to complete the NCSCS or ASCS score to seek FCSAP remediation/risk management (R/RM) funds

Custodians should complete the National Classification System for Contaminated Sites (NCSCS) and/or the Aquatic Site Classification System (ASCS) worksheets to seek remediation/risk management (R/RM) FCSAP funds only when sufficient site information is available.

Custodians should base their classification score on the most up to date site information (*i.e.*, up to and including Step 5 of *A Federal Approach to Contaminated Sites*). If a site was originally classified using information from Step 3 (*i.e.*, phase II Environmental Site Assessment (ESA)) and Step 5 (*i.e.*, detailed phase III ESA) was later completed, the site should be re-scored during Step 6 before seeking R/RM FCSAP funds.

Custodians should not re-score a site during project implementation, (i.e., once it has been appropriately classified following ES site eligibility review and after R/RM expenditure has begun, or after the R/RM activities are completed). If re-scoring is being considered for an exceptional reason, contact your EC ES regional coordinator to discuss prior to initiating re-scoring.[1]

Detailed risk assessment work (*i.e.*, Detailed Quantitative Risk Assessment (DQRA)/Human Health and Ecological Risk Assessment/Site Specific Risk Assessment) is considered part of the R/RM activities under FCSAP. Therefore, DQRA information is not normally used for completing the NCSCS or ASCS worksheets. However, if the DQRA was completed prior to the site being submitted for FCSAP R/RM funds, it is appropriate to use the assessment results to score the site using the NCSCS or ASCS if the conclusions of the risk assessment are still valid (see section 2.3 : Age of the site data).

1.2) Supporting documentation requirements

1.2.1 Site eligibility review

In addition to the NCSCS or ASCS worksheets, all supporting documents used to complete the worksheets (including site assessment and risk assessment reports) must be uploaded to the Interdepartmental Database for Exchange Application (IDEA). A detailed site plan must be uploaded to

[1] FCSAP utilizes the NCSCS to establish funding eligibility for remediation/risk management activities on federal contaminated sites. In the NCSCS Worksheet “Summary of Site Conditions a letter grade is assigned depending on the level of work completed. When determining eligibility for FCSAP funding, the letter grade “A” (Confirmation Sampling completed) is typically not applicable.

IDEA as a separate document in the “Attachment” tab of IDEA, and labelled appropriately. Custodians are responsible for ensuring documents are appropriately separated, labelled, and uploaded to IDEA so they can be found easily by ES. Mistakes and inaccuracies in uploading documents to IDEA can cause delays in the review process and confirmation of site eligibility. Reports should not be forwarded directly to ES reviewers unless they are experiencing technical difficulties related to IDEA that cannot be resolved in a timely manner and it is agreed upon beforehand by both parties.

Custodians should only submit final supporting documents (not draft versions) for the review of site eligibility. NCSCS and ASCS scores supported by documents in draft format will not be used by ES for reviewing FCSAP R/RM site eligibility unless previously approved by ES.

The NCSCS or ASCS worksheets should be provided in Excel format and not in PDF format; this will improve efficiency of the site eligibility review process by ES.

1.2.2 Comprehensive technical review of supporting documents

Custodians should be aware that ES will not provide a comprehensive technical site review of supporting documents during the site eligibility review process, although specific comments on the supporting documents may be made by ES at this juncture.

A detailed technical review of these documents, as requested by custodians, is one of the key functions of the ES departments. However, workload priority will be given first to eligibility review and to confirm site eligibility with custodians. A comprehensive technical review of site assessment reports will occur, upon request, separate from the site eligibility review process.

1.3) Providing rationale and references for worksheet scores

Custodians must provide adequate rationale to justify scores in all of the sections of the NCSCS or ASCS worksheets, including the “Do Not Know” responses. In the rationale column of the NCSCS or ASCS worksheets, custodians should reference specific sections of a report where relevant information can be found (*i.e.*, the name of the report and the page where the information can be found). ES may elect not to review submissions without proper references. These submissions would be returned to the custodian with a request that sufficient rationale be provided for each section prior to re-submitting the NCSCS spreadsheet. This may result in delays to site eligibility review and eligibility confirmation.

1.4) Federal Contaminated Sites Inventory (FCSI) number in the NCSCS and ASCS worksheets

The Federal Contaminated Sites Inventory (FCSI) and/or Parcel Identifier Number(s) (PIN(s)) should be included in the text box in the Site Description section of the NCSCS or ASCS worksheets. This information will allow (if necessary) the ES to search for additional information on the FCSI database and to avoid confusion related to changes in site names.

2) Definitions and other requirements

2.1) Automatic Class 1 using only the pre-screening checklist

Custodians are reminded that they must complete all the NCSCS or the ASCS worksheets including the pre-screening checklist worksheet. The pre-screening checklist should always be completed since health and environmental issues can be further identified by the completion of this worksheet. A site scored as Class 1 using only the pre-screening checklist will not be considered eligible for FCSAP R/RM funding without the completion of the remaining NCSCS or ASCS worksheets for eligibility review.

2.2) Use of CCME vs. provincial or territorial guidelines

The FCSAP program funds R/RM activities to the level of protection of the CCME criteria (e.g. Canadian Environmental Quality Guidelines (CEQG), Canada Wide Standards (CWS) for Petroleum Hydrocarbons (PHC)). The NCSCS or ASCS scores for site eligibility requirements should be based on CCME or FCSAP guidelines (e.g., Federal Interim Groundwater Quality Guidelines, (FIGQGs)).

Guidelines from other jurisdictions (e.g., provincial or U.S. Environmental Protection Agency (USEPA)) may be used if the CCME or FCSAP guidelines are not available for certain contaminants or certain media. However, these alternative guidelines should offer an equivalent level of protection to those identified by the CCME (1999, 2006, 2007, 2008), Health Canada (1995) and/or the FCSAP program.

It should be noted that FCSAP funds can only be used to remediate the site to a level appropriate for the current or intended federal land use. For example, in the case of a site divestiture, FCSAP funds can only be used to remediate the site to a level appropriate for the current or intended federal land use and not to the level required for the planned or intended use by a (non-federal) third party following divestiture of the site. Similarly, for sites on non-federal land, FCSAP funds can only be used to remediate the site to federal guidelines (i.e., CEQGs and FIGQGs) for the current or intended future land use. If the relevant provincial or territorial criteria are

more stringent, custodians will be responsible for the additional cost to achieve those criteria. As such, NCSCS and ASCS scores should be developed based on data screened against the appropriate federal guidelines.

The CCME Canadian Environmental Quality Guidelines (CEQGs) Summary Table is available online at http://st-ts.ccme.ca/. The online summary table allows the CEQGs to be searched by chemical and/or guideline. The summary table is also linked to the CEQG online fact sheets for ease of verifying specific information, and obtaining implementation guidance for each environmental quality guideline.

The FIGQGs were developed by EC to assist federal custodians in the assessment and R/RM of federal contaminated sites funded under the FCSAP. These interim guidelines are only intended to be used until the Canadian Groundwater Quality Guidelines are available from CCME. The interim guidelines are available on IDEA or from the FCSAP Secretariat at FCSAP.PASCF@ec.gc.ca upon request.

2.3) Age of the site data

Outdated information may not reflect current conditions and prevent the site assessor from drawing appropriate conclusions. Some chemicals are known to undergo extensive environmental degradation and/or are highly mobile in the environment. The types of contaminants, the media in which they are reported, their chemical characteristics, or the magnitude of contamination reported may also change over time. Furthermore, relevant guidelines may also change with time. Thus, recent characterization and assessment of the data are recommended. Where site characteristics are not expected to change, based on chemical-specific parameters, this should be noted in the report. However, in this case, the report should identify whether any guidelines have changed and update the information accordingly.

Ecological or human health risk assessments are considered outdated when the conclusions are invalid (e.g., based on older site characterization data or toxicity reference values which are no longer accepted, etc.). This could occur when changes to assumptions in the risk assessment such as land use, receptors, exposure pathways, or changes in levels of contamination affect the risk estimates for terrestrial species, aquatic species or humans (e.g., hazard quotients, incremental lifetime cancer risks, etc.).

As a general rule, the NCSCS or ASCS scores should be based on data less than five years old, unless a rationale is provided that explains why older data is still relevant. Professional judgement will always be required to make appropriate decisions on the reliability of site data. It is

recommended that custodians contact their regional EC ES coordinator to discuss the use of historic site data for NCSCS or ASCS scoring if the data quality is suspect (contact the FCSAP Secretariat, FCSAP.PASCF@ec.gc.ca, for regional contact information).

Where only historical data is available for an NCSCS or ASCS score, ES may recommend, depending on the particulars of a site, that the custodian carry out additional assessment work to characterize existing conditions at the site prior to approving the site as eligible for FCSAP R/RM funds. If additional sampling cannot be conducted, a rationale must be provided and accepted by ES. The selected remedial strategy should include further investigation and assessment as the work proceeds to properly identify and delineate any contaminated areas.

2.4) Using the NCSCS or ASCS for a mixed (terrestrial and aquatic) site

Custodians should use the ASCS if the site is a water lot or if it meets the following definition of an aquatic site:

> "An aquatic site is defined as a water lot, or land or part of land that is completely, partially, or occasionally submerged by water. This includes the hyporheic zone (where shallow groundwater and surface water mix), but excludes deep-seated groundwater, and applies to both freshwater and marine sites. Exceptions to the above definition may be established, on a case-by-case basis, using professional judgment."

The general rule of thumb, unless proven otherwise, is that everything below the 2 year active floodplain mark is an aquatic site and everything above is an upland site.

On a mixed site (upland and aquatic), the NCSCS is the default scoring system. Alternatively, custodians may create two sites and obtain two separate FCSI numbers (one for the aquatic portion and one for the upland portion). Any custodian who is considering creating two sites from one mixed site is encouraged to contact expert support to discuss the potential implications of this approach.

There can only be one score for each FCSI identifier (one site = one score).

2.5) Who should fill in the NSCCS or ASCS worksheets?

The user (the person applying the classification system) should be an experienced professional with appropriate technical expertise. For some evaluation factors, it is recommended that the user consult a technical specialist. For example, a

hydrogeologist should be consulted regarding permeability of geologic materials. It may also be necessary to consult environmental chemists and biologists or other environmental scientists and professionals to assist in the interpretation of site conditions and impacts.

3) Supplemental Guidance for the NCSCS worksheets

The following tables provide guidance on specific questions in the NCSCS worksheets in order to reduce uncertainties and ensure consistency in NCSCS scoring.

Pre-Screening Checklist	
NCSCS Sections	**FCSAP Supplemental Guidance**
Custodians must complete all NCSCS worksheets (including the Pre-screening checklist) for sites under consideration for R/RM funding under the FCSAP. A site scored Class 1 using only the pre-screening checklist will not be considered eligible for FCSAP R/RM funding. A NCSCS score is required for the eligibility review.	
Question 7. Do measured concentrations of volatiles or unexploded ordnances represent an explosion hazard?	The presence of unexploded ordnances (UXOs) at a site does not warrant an automatic Class 1 ranking. The explosive hazards from UXOs are of a different nature than hazards from chemical contaminants, and are not compatible with the NCSCS. Any legacy chemical contamination resulting from UXOs that may pose a risk to human health should be reflected in the NCSCS score, and will be addressed by FCSAP (if eligible). FCSAP would fund the removal of UXOs only as an indirect cost, and only if they are present on eligible sites.

Worksheet I Contaminant Characteristics	
NCSCS Sections	**FCSAP Supplemental Guidance**
1. Residency Media	Residency media is defined as any media that has been (or may have been) affected by site activities and for which the site owner or manager is responsible. If media outside of the property boundaries have been affected, these should be considered in scoring this question and should be addressed in the remediation/risk management plans. For example, if site activities resulted in soil and groundwater contamination within the property boundary in addition to off-site sediment and surface water contamination in an adjacent water body, the adjacent off-site sediment and surface water contamination in addition to the on-site soil and groundwater should be addressed in the remediation and/or risk management plan for this site and the response to questions 1.C and 1.D should be “Yes”. If off-site media have not been sampled but are strongly suspected to have been impacted by site activities, a response of “Do Not Know” may be appropriate and the site owner would be responsible for investigating and addressing the off-site contamination. Any contamination in off-site media that is not directly related to the site or is not the responsibility of the site owner or manager should not be included in the scoring. For example, if the water body adjacent to a contaminated site (e.g. battery storage facility) is contaminated from a source that is not related to the site (e.g. PAHs from creosote pilings) the response to questions 1.C and 1.D should be “No” because the sediment and surface water contamination was not caused by the contaminated site and is not the responsibility of the site owner.
3. Contaminant Exceedance Factor What is the ratio between the measured contaminant concentration and the applicable CCME guidelines (or other "standards")? Mobile LNAPL High (>100x) Medium (10x to 100x) Low (1x to 10x)	Mobile or immobile free phase product (i.e., light non-aqueous phase liquid (LNAPL) or dense non-aqueous phase liquid (DNAPL)) should receive the maximum score. Free product occurs when the residual saturation limit of the soil is exceeded and liquid phase product pools at the water table (as in the case of an LNAPL) or at the base of the aquifer (as in the case of a DNAPL). Free product may also accumulate on layers of lower permeable soils above the water table. Where a significant quantity of free product exists, it may be mobile and will act as a long-term, on-going source of contamination to local soil and groundwater. The justification for free product should include a conceptual site model (CSM), which is a visual representation and narrative description of the physical, chemical, and biological processes occurring, or that have occurred, at the site.

Worksheet I Contaminant Characteristics	
NCSCS Sections	**FCSAP Supplemental Guidance**
4. Contaminant Quantity (known or strongly suspected) What is the known or strongly suspected quantity of all contaminants?	A rationale for the score should include a detailed calculation of the estimated volume or surface area of contaminated media. This information should be available from a Phase II or Phase III ESA.
5. Modifying Factors Does the chemical fall in the class of persistent chemicals based on its behaviour in the environment?	If a chemical substance is not identified in the persistent substances list provided in the "Reference Material" worksheet of the NCSCS, custodians will need to provide an appropriate rationale and reference(s) for identifying the chemical as persistent.
5. Modifying Factors Are there contaminants present that could cause damage to utilities and infrastructure, either now or in the future, given their location?	For the purposes of scoring, this question pertains to current or future damage to *existing* utilities and infrastructure (and not to utilities and infrastructure that may be installed in the future). If there are currently no active utilities at the site, the response should be "No". If utilities or infrastructure are present on the site that could be damaged by environmental contaminants at the site, custodians should: • Document the location and extent of the active infrastructure they feel may be damaged. • Verify the mode of contact between contaminants of potential concern (COPCs) and active infrastructure. • List the specific COPCs they feel could cause damage to specific active infrastructure. • Note the expected effect on specific active infrastructure (e.g., corrosion).

Worksheet II Migration Potential	
NCSCS Sections	**FCSAP Supplemental Guidance**
Sections 1 to 5	For each medium in Sections 1 through 5, subsection B (the 'potential' section) should only be filled out if a response of "Go to potential" is given in subsection A (the 'known or strongly suspected' section). If both section A and B are filled out, the responses to section B will not count toward the overall score but they will count toward the overall percentage of responses that are "Do Not Know". In some cases this could lead to a site being incorrectly classified as "INS". The response for a given medium should be consistent with the response for the corresponding medium in the first question on Worksheet I (Contaminant Characteristics). In particular, if a response of "Do not know" is given for a medium in Worksheet I, question 1, a response of "Go to Potential" should be provided for Section A for that medium on Worksheet II and Section B should be filled out. For example, if a response of "Do not know" is given for question 1.B (groundwater) on Worksheet I, the response to question 1.A on Worksheet II (Migration Potential) (i.e., known COPC exceedances and an operable groundwater pathway within and/or beyond the property boundary) should be "Go to potential" and the questions under section 1.B of Worksheet II should be filled out. Similarly, if a response of "No" is given for question 1.B (groundwater) on Worksheet I, the response to question 1.A on Worksheet II should be "Absence of groundwater exposure pathway" and a score of "0" should be assigned to this question.
1. Groundwater Movement A. Known COPC exceedances and an operable groundwater pathway within and/or beyond the property boundary. ii) Same as (i) except the information is not known but strongly suspected based on indirect observations.	To use the ii) score (9 points): • The contaminant concentrations in groundwater must be strongly suspected to exceed background and the relevant FIGQGs; or • The presence of toxic chemicals with no FIGQG value(s) must be strongly suspected. This score should be used when chemical analysis for those suspected contaminants has not yet been carried out but groundwater contamination is inferred (e.g. visible sheen in areas with groundwater seepage). If groundwater contamination is suspected, but it is not documented, the response should be "Do Not Know" and the "Potential for groundwater pathway" section should be filled out. E.g., a buried drum is discovered using geophysical surveys and is suspected to contain waste oils based on historic site usage. The drum is suspected to have leaked and contaminated the groundwater but the soil and groundwater have not been investigated and there is no evidence of contamination. In this case the response should be "Go to Potential" and the "Potential for groundwater pathway" should be filled out.

Worksheet II Migration Potential	
NCSCS Sections	**FCSAP Supplemental Guidance**
1. Groundwater Movement B. Potential for groundwater pathway a. Relative mobility	Relative mobility for CWS PHC fractions should be scored as follows: F1 = moderate F2 = low F3 & F4 = insignificant.
2. Surface Water Movement A. Demonstrated migration of COPC in surface water above background conditions. ii) Same as (i) except the information is not known but strongly suspected based on indirect observations.	Demonstrated migration means documented evidence is provided. If there is no documented evidence of migration of COPCs in surface water above background conditions, custodians should complete the "Potential" section. Examples of indirect evidence could be seen on sediment and/or staining of river banks, but surface water has not been tested.
2. Surface Water Movement A. Demonstrated migration of COPC in surface water above background conditions. iii) Meets CWQG or absence of surface water exposure pathway (i.e., distance to nearest surface water is > 5 km)	Option iii) should read "Meets CWQG or absence of surface water exposure pathway (**e.g.,** distance to nearest surface water is > 5 km)". A score of "0" may be appropriate if there is no surface water exposure pathway regardless of the distance to the nearest surface water (e.g., even if surface water is < 5km). For example, if there is no surface water on-site, the contamination is confined to deep soils and groundwater has not been impacted, it may be reasonable to assume that any nearby surface water bodies would not be impacted by the site. Note that up-gradient surface water with no potential to be impacted by contamination at the site should not be considered in scoring this question.
3. Surface Soils (potential for dust, dermal, and ingestion exposure) A. Demonstrated concentrations of COPC in surface soils (top 1.5 m). Strongly suspected that soils exceed guidelines.	To use this score (9 points): • The contaminant concentrations in soil must be <u>strongly</u> suspected to exceed background and the relevant CEQG; or • The presence of contaminants with no CEQG value(s) or relevant alternatives (see Section 2.2) must be strongly suspected. For example: It may be strongly suspected that soils exceed guidelines if there is evidence of staining, odours or significant debris in fill materials."

Worksheet II Migration Potential	
NCSCS Sections	**FCSAP Supplemental Guidance**
4. Vapour A. Demonstrated COPCs in vapour. Vapour has been measured (indoor or outdoor) in concentrations exceeding risk based concentrations. Strongly suspected (based on observations and/or modelling). Vapour has not been measured and volatile hydrocarbons have not been found in site soil or groundwater.	With appropriate justification, the definition of vapour in this section can be broadened to include volatile chemicals (not just volatile hydrocarbons). Section A (Demonstrated COPCs in vapour) should only be filled out if vapour data have been collected or if appropriate vapour modelling has been completed for the site. If vapour data are not available and modelling has not been completed, or there is insufficient data available to determine whether there is a vapour issue, the response to Section A should be "Go to Potential", and Section B (Potential for COPCs in vapour) should be filled out. Vapour monitoring studies can be very limited (i.e., a one-time event) and as such, if a known volatile substance is present at a site and is not detected in a single vapour monitoring event, this does not necessarily mean that vapours are not an issue at the site; it only means the monitoring study (a snap shot in time) did not detect any vapours. In this case, the "Potential for COPCs in vapour" section should be filled out. However, for cases when a detailed vapour monitoring program was conducted and no vapours were detected, a score of 0 would apply.
5. Sediment Movement A. Demonstrated migration of sediments containing COPCs.	This section of the NCSCS assesses contaminant migration within as well as outside the FCSAP site. If sediments at the site have not been sampled and there is potential for sediments to have been impacted by site activities, the response to Section A should be 'Go to potential' and Section B should be filled out. If sediments are not present at the site and there is no indication that sediments near the site have been impacted by the site, the score of sub-section II.5 (Sediment Movement) should be 0. A score of 0 should be selected in cases where sediments are fully contained and there is no indication that sediments will migrate in the future, as per the instructions in the worksheet. If sediments do not exceed CCME guidelines or if there is no sediment exposure pathway, a score of "0" should be assigned for this question. It is possible to have an absence of a sediment exposure pathway even if there are receiving environments within 5 km of the site. For example, if there are no water bodies on-site, the contamination is confined to deep soils and groundwater has not been impacted, it would be reasonable to assume that any nearby surface water bodies would not be impacted by the site. In this case, there would be an absence of a sediment exposure pathway and the response should be "0" (regardless of the distance to the nearest surface water body).

Worksheet II Migration Potential	
NCSCS Sections	**FCSAP Supplemental Guidance**
5. Sediment movement B. Potential for sediment migration b. For lakes and marine habitats, are the contaminated sediments in shallow water and therefore likely to be affected by tidal action, wave action or propeller wash?	This question pertains to lakes and marine environments. If the surface water in question is not a lake or marine environment (e.g., if it is a river) the response should be "No".
5. Sediment movement B. Potential for sediment migration c. For rivers, are the contaminated sediments in an area prone to sediment scouring?	This question pertains to rivers. If the water body in question is not a river, the response should be "No".

Worksheet III Exposure	
NCSCS Sections	**FCSAP Supplemental Guidance**
1. Human A. Known exposure Documented adverse impact or high quantified exposure that has or will result in an adverse effect, injury or harm, or impairment of the safety to humans as a result of the contaminated site. (Class 1 site) Same as above, but "Strongly Suspected" based on observations or indirect evidence. No quantified or suspected exposures/impacts in humans.	If a DQRA has been completed for the site, score = 0 when hazard quotient (HQ) or hazard index (HI) and incremental lifetime cancer risks (ILCR) are within acceptable levels (i.e.,HQ or HI ≤ 0.2 excluding the estimated daily intake (EDI) or ≤ 1 with EDI and ILCR ≤ 10^{-5} for federal sites (HC 2010)). Score = 10 when HQ (or HI) > 0.2 (excluding the EDI) or > 1.0 with EDI and/or ILCR that exceed acceptable levels defined by the jurisdiction (i.e., > 10^{-5} for federal sites). Score = 22 when HQ (or HI) >> 1.0 or an ILCR that considerably exceeds acceptable levels (e.g., HQ > 10 or ILCR > 10^{-4}). If the results of a PQRA are considered in scoring this question then the PQRA should be reviewed to ensure that the assumptions are consistent with site use. If the PQRA is considered highly conservative and not consistent with actual site use, the results and health risks may be substantially overestimated and should not be used in scoring this question. Score = 22 if there are documented adverse effects and the site should be automatically designated as Class 1 (action required). Known impacts could include blood test results which show that contamination from the site is associated with elevated exposure levels that may be associated with adverse health effects (e.g., blood lead > 10 µg/dL) or results of other health based studies and tests. However, contrary to the guidance provided in the Method of Evaluation column of the NCSCS worksheet, the entire NCSCS worksheet must still be completed even if an automatic Class 1 designation is anticipated based on adverse human health effects. An automatic Class 1 designation will not typically be warranted (i.e., score of 22) based on the results of a risk assessment alone. The presence of UXOs at a site does not warrant an automatic 'known' human exposure score of 22. The explosive hazards from UXOs are of a different nature than hazards from chemical contaminants, and are not compatible with the NCSCS. A known score could be calculated based on other direct evidence for the site, or from the results of a human health risk assessment. A potential score should be calculated in the absence of other information. Any legacy chemical contamination resulting from UXOs that may pose a risk to human health will still be reflected in the NCSCS score, and will be addressed by FCSAP (if eligible). FCSAP would fund the removal of UXOs only as an indirect cost, and only if they are present on eligible sites. The presence of volatiles representing an explosive hazard does warrant an automatic 'known' human exposure score of 22. Unlike UXOs, the explosive hazard from volatiles results directly from chemical contamination at a site and is compatible with the NCSCS.

Worksheet III Exposure	
NCSCS Sections	**FCSAP Supplemental Guidance**
1. Human B. Potential for human exposure, a) Land use	For sites that are located in National parks or on wild land, a response of “Agricultural” is typically most appropriate because it provides habitat for resident and transitory wildlife and native flora (unless the site is being used for residential, commercial or industrial purposes); however, land use in campground areas within National parks should be considered residential/parkland because it is a buffer between areas of residency. Military training use may be unique and sufficiently different from the four CCME and NCSCS land use definitions (including industrial), that it may warrant a "Do Not Know" designation. Activities on military ranges and training areas may include small firearms shooting exercises, artillery training and large scale manoeuvers involving all branches of Land Forces (NRC, 2006).
1. Human B. Potential for human exposure, c. Potential for intake of contaminated soil, water, sediment or foods for operable or potentially operable pathways, as identified in Worksheet II (Migration Potential), ii) Inhalation, (i.e., inhalation of dust, vapour) Vapour - Are there inhabitable buildings on the site within 30 m of soil or groundwater with volatile contamination as determined in Worksheet II (Migration Potential)?	This question pertains to the current scenario not potential future scenarios. If there are currently no buildings present within 30 m of the impacted soil and/or groundwater, the response should be “No”.

Worksheet III Exposure	
NCSCS Sections	**FCSAP Supplemental Guidance**
1. Human B. Potential for human exposure c. Potential for intake of contaminated soil, water, sediment or foods for operable or potentially operable pathways, as identified in Worksheet II (Migration Potential), ii) inhalation (i.e., inhalation of dust, vapour) Dust – If there is contaminated surface soil (e.g., top 1.5 m), indicate whether the soil is fine or coarse textured. If it is known that surface soil is not contaminated, enter a score of zero.	Energetic materials (defined as "*Substances able to undergo exothermic reactions at extremely fast rates producing gaseous products at high pressure and temperature*") are released in powder form and are reported to potentially undergo aerial transport (US EPA, 2012). Therefore, a response of "Fine" may be appropriate, regardless of the soil characteristics at the site.
1. Human B. Potential for human exposure c. Potential for intake of contaminated soil, water, sediment or foods for operable or potentially operable pathways, as identified in Worksheet II (Migration Potential), iii) Ingestion (i.e., ingestion of food items, water and soils [for children]), including traditional foods, Drinking Water: Choose a score based on the proximity to a drinking water supply, to indicate the potential for contamination (present or future).	If the drinking water supply has been shown to be clearly up-gradient of the contamination or if the results of a hydrogeological assessment indicate no potential connection between an aquifer supplying drinking water and the contamination at the site, the response should be "No drinking water present". In this case there should be no potential for contamination at the site to impact the drinking water source. If local groundwater or surface water will likely be used as a potable source in the future but there are currently no specific plans for where the water will be drawn from and there are currently no plans for remediating groundwater to drinking water guidelines, a response of "no drinking water present" or "do not know" would be applicable. For sites with no plans to use local groundwater or surface water as a potable source, a score of "no drinking water present" is recommended (i.e., drinking water is supplied from a municipal source).

Worksheet III Exposure	
NCSCS Sections	**FCSAP Supplemental Guidance**
1. Human B. Potential for human exposure c. Potential for intake of contaminated soil, water, sediment or foods for operable or potentially operable pathways, as identified in Worksheet II (Migration Potential), iii) Ingestion (i.e., ingestion of food items, water and soils [for children]), including traditional foods, Is an alternative water supply readily available?	This question does not include a "Not Applicable" option for situations where the drinking water supply is up-gradient of the contamination and/or there is no potential for the drinking water to be impacted by contamination at the site. Therefore, if the response to the previous question (Worksheet III, Question 1.B.c.iii: proximity to a drinking water supply) was "No drinking water present" the response to the question of whether an alternative water supply is available should be "Yes".
2. Human Exposure Modifying Factors a. Strong reliance of local people on natural resources for survival (i.e., food, water, shelter, etc.)	This question refers to a **strong reliance** of local populations on natural resources. Note that the previous question (III.1.B.c.iii, final question) addresses whether people harvest and consume plants and/or animals from the contaminated land or the surrounding area. A response of "Yes" may be appropriate with evidence of strong reliance of local populations on local resources. For a response of "Yes" related to significant consumption of country foods, it must be clearly demonstrated that there is potential for the country foods that are consumed to be impacted by contamination at the site.
3. Ecological A. Known exposure	Maximum points are allocated to section 3A only when there are documented adverse impacts. "Strongly suspected" or "potential" adverse impacts, as determined in an ecological risk assessment, should not score 18 points. Expert Support should be contacted in order to clarify what is meant by "documented adverse impacts" when completing this section of the scoring.
3. Ecological B. Potential for ecological exposure (for contaminated portion of the site) a) terrestrial i) Land use	Military training use is unique and sufficiently different from the four CCME and NCSCS land use definitions (including industrial), that it may warrant a "Do Not Know" designation. Activities on military ranges and training areas may include small firearms shooting exercises, artillery training and large scale manoeuvers involving all branches of Land Forces (NRC, 2006).

Worksheet III Exposure	
NCSCS Sections	**FCSAP Supplemental Guidance**
3. Ecological B. Potential for ecological exposure (for contaminated portion of the site) a. Terrestrial iii) Ingestion (i.e., wildlife or domestic animals ingesting contaminated food items, soils or water) Are terrestrial animals likely to be ingesting contaminated water at the site?	Please refer to the Method of Evaluation column on Worksheet II, Question 2.A for a definition of surface water. For the purposes of scoring this question, semi-permanent standing water and ephemeral streams may also be considered if they are present in an area where there is potential for it to be contaminated and if there is potential for terrestrial species to ingest the water even if the water body does not support recreation, irrigation, livestock watering or aquatic life uses. Sufficient documentation and rationale must be provided to support the potential for terrestrial animals to ingest contaminated water at the site. If there is no evidence of surface water present on the site, the response should be "No". If there is surface water at the site but it has not been sampled, the response should be "Do Not Know".
B. Potential for ecological exposure (for the contaminated portion of the site) a) Terrestrial iii) Ingestion (i.e., wildlife or domestic animals ingesting contaminated food items, soils, or water) Distance to sensitive terrestrial ecological area?	Distance to sensitive ecological area: Typically, sensitive ecological areas would only be those identified by the local conservation authority, provincial department of the environment or natural resources, or relevant federal authorities. In your rationale, clarify if any of the areas surrounding this site are formally identified as such (e.g., Provincially Significant Wetland, Species at Risk, etc.). Otherwise, custodians should score "Do Not Know" on this question. Arctic environments can be considered a sensitive ecological area under specific circumstances. This will be evaluated case-by-case and based on the justification provided.
3. Ecological B. Potential for ecological exposure (for the contaminated portion of the site) b. Aquatic i) Classification of aquatic environment	This section pertains to ecological exposure "for the contaminated portion of the site" and the response should be consistent with that for the first question of Worksheet I regarding residency media. In particular, if the response to Worksheet I, Question 1.C (surface water) is "No", the response to this question should be "Not Applicable" as there is no surface water on the site or near the site that has been impacted by site activities. Please note that ephemeral watercourses that contain water for only part of the year may be classified as an aquatic environment, depending on site specific information. Reasonable supporting information and rationale must be given.

Worksheet III Exposure	
NCSCS Sections	**FCSAP Supplemental Guidance**
3. Ecological B. Potential for ecological exposure(for the contaminated portion of the site) b. Aquatic ii) Uptake potential Does groundwater daylighting to an aquatic environment exceed CCME water quality guidelines for the protection of aquatic life at the point of contact?	If groundwater is known or suspected to be impacted but there are insufficient data to show that groundwater daylighting to surface water exceeds CCME guidelines for the protection of aquatic life, the response should be “Do Not Know”. If groundwater does not exceed applicable guidelines, the response should be “No”.
4. Ecological Exposure Modifying Factors b. Potential impact of aesthetics (e.g., enrichment of a lake or tainting of food flavour) Is there evidence of aesthetic impact to receiving water bodies? Is there evidence of olfactory impact (i.e., unpleasant smell)? Is there evidence of increase in plant growth in the lake or water body? Is there evidence that fish or meat taken from or adjacent to the site smells or tastes different?	If the impact in question has not been noted in the Phase I ESA or another relevant document and if it is unlikely that the impact in question could occur as a result of contamination at the site, the response should be “No”. For example, if there is no evidence of contaminants at the site that could result in increased growth of aquatic vegetation, the response to “Is there increase in plant growth in the lake or water body?” should be “No”. If the impact in question could occur as a result of contaminants found at the site and site conditions, but it has not been evaluated, a response of “Do Not Know” may be appropriate. The question regarding tainting of fish or meat pertains to both aquatic and terrestrial environments.

4) Supplemental Guidance for the Evaluation of Human Health
4.1) Risks for Aquatic Sites Classification System (ASCS) Scoring Purposes

6. Receptors and Exposure	
ASCS Section	**FCSAP Supplemental Guidance**
3. Current/past exposure of human receptors to contaminants in site media	
3a. Choose A, B, C, or D from the list below by selecting the desired letter from the drop-down list in cell C44:	
A: Documented adverse impact or quantified exposure level that has or will likely result in an adverse effect, injury or harm, or impairment of the safety to humans as a result of the contaminated site. (Class 1 site)	If a DQRA has been completed for the site, score = 22 when the human health risk assessment indicates HQ (or HI) >> 1.0 and/or an Incremental Lifetime Cancer Risk (ILCR) that considerably exceeds levels defined by the jurisdiction (e.g., HQ >10 or ILCR > 10^{-4}) for direct and indirect surface water, sediment exposure pathways, and/or seafood ingestion pathways. If the results of a PQRA are considered in scoring this question then the PQRA should be reviewed to ensure that the assumptions are consistent with site use. If the PQRA is considered highly conservative and not consistent with actual site use, the results and health risks may be substantially overestimated and should not be used in scoring this question. This score also applies to human health-based fisheries advisories and closures for sites where bioaccumulative and/or biomagnifying chemical contaminant(s), exceeding the applicable aquatic media criteria (or background) at the site, are linked to the chemical contaminant(s) identified in the advisory or site closure. Sanitary and PSP (Paralytic Shellfish Poisoning) closures and non-chemical advisories such as those resulting from faecal contamination and/or not related to the site or site activities are not applicable. The standard DFO permanent bivalve fishing prohibited areas within 125 m of marinas, wharves, finfish net pens, float homes and live aboard boats and within 300 m minimum of any major point source discharge such as sewage outfalls should not be considered in scoring this question. Score = 22 if there are documented adverse effects to human receptors and the site should automatically be designated as Class 1 (action required). Known adverse effects could include blood test results which show that contamination from the site is associated with elevated exposure levels that may be associated with adverse health effects (e.g., blood lead > 10 µg/dL) or results of other health based studies and tests. Please note that the entire ASCS worksheet must be completed even if an automatic Class 1 designation is anticipated due to documented adverse effects to human receptors. An automatic Class 1 designation will not typically be warranted for sites with a score of 22 based on the results of a risk assessment or based on a fisheries advisory or closure.

6. Receptors and Exposure	
ASCS Section	**FCSAP Supplemental Guidance**
B: Same as above, but "Strongly Suspected" based on observations or indirect evidence.	Score = 12 when the human health risk assessment indicates HQ (or HI) > 0.2 (excluding the EDI) or > 1.0 (with EDI) and/or ILCR that exceed acceptable levels defined by the jurisdiction (10^{-5} for federal sites) for direct and indirect surface water, sediment exposure pathways, and/or seafood ingestion pathways.
C: No quantified or suspected exposures/impacts in humans.	Score = 0 when the human health risk assessment indicates HQ (or HI) ≤ 0.2, (excluding the EDI) or ≤ 1.0 (including the EDI) and/or ILCR are within acceptable levels as defined by the jurisdiction (≤ 10^{-5} for federal sites) for direct and indirect surface water, sediment exposure pathways, and/or seafood ingestion pathways.
D: Do Not Know	If "Do Not Know" is selected, questions 3b through 3h must be scored.

References:

Canadian Council of Ministers of the Environment (CCME). 1999. Protocol for the Derivation of Canadian Sediment Quality Guidelines for the Protection of Aquatic Life. CCME EPC-98E.

Canadian Council of Ministers of the Environment (CCME). 2006. A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines

Canadian Council of Ministers of the Environment (CCME). 2007. A Protocol for the Derivation of Water Quality Guidelines for the Protection of Aquatic Life 2007.

Canadian Council of Ministers of the Environment (CCME). 2008a. Canada Wide Standard for Petroleum Hydrocarbons (PHC) in Soil: Scientific Rationale Technical Supporting Document. PN1399. ISBN 978-1-896997-77-3 PDF.

Canadian Council of Ministers of the Environment (CCME). 2008b, National Classification System for Contaminated Sites: Guidance Document.

Canadian Council of Ministers of the Environment (CCME). 2012. FCSAP Aquatic Site Classification System

Canadian Council of Ministers of the Environment (CCME). 2012. FCSAP Aquatic Site Classification System (2012) Detailed User Guidance Manual.

Canadian Council of Ministers of the Environment (CCME). 2008, 2012 V1.2. National Classification System for Contaminated Sites

Health Canada. 1995. Approach to the derivation of Drinking Water Guidelines.

Health Canada. 2010. Federal Contaminated Site Risk Assessment in Canada, Part V: Guidance on Human Health Detailed Quantitative Risk Assessment for Chemicals ($DQRA_{CHEM}$).

National Research Council Canada (NRC). 2006. Development of Ecological and Human Health Preliminary Soil Quality Guidelines for Energetic Materials to Ensure Training Sustainability of Canadian Forces.

US EPA. 2012. Site Characterization for Munitions Constituents. EPA-505-S-11-001

www.ec.gc.ca

Additional information can be obtained at:

Environment Canada
Inquiry Centre
10 Wellington Street, 23rd Floor
Gatineau QC K1A 0H3
Telephone: 1-800-668-6767 (in Canada only) or 819-997-2800
Fax: 819-994-1412
TTY: 819-994-0736
Email: enviroinfo@ec.gc.ca