

Thames-Sydenham and Region - Assessment Reports

Threats and Risk Assessment

The Clean Water Act prescribes activities which may be considered drinking water threats. The activities associated with drinking water quality are summarized in the Threats and Risk Assessment Section of the Assessment Report. The risk associated with Water Quantity Threats is considered in the Water Budget and Water Quantity Stress Assessment section of the AR. Risk Assessment is the process of assessing the threats to determine their relative risk to the drinking water source. It considers the vulnerability of the area that the activity is being undertaken in. It also considers the hazard associated with the activity.

What is a Drinking Water Threat?

A drinking water threat is an “activity or condition that adversely affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as source of drinking water”.

Prescribed Drinking Water Threats

Through the Clean Water Act and General Regulation 287/07, a list of 21 prescribed drinking water threats is provided. That list is reproduced in the Threats and Risk Assessment Section of the Assessment Report and summarized in Table 1.

Table 1 – Summarized List of Prescribed Drinking Water Threats

- Application, handling and storage of agricultural source material (manure), non-agricultural source material (bio-solids), commercial fertilizer, pesticide or road salt
- Handling and storage of fuel, dense non-aqueous phase liquids, or organic solvents
- Management of runoff that contains aircraft de-icing chemicals
- Livestock grazing or pasturing land, outdoor confinement areas or farm-animal yards Snow storage
- Systems that collect, store, transmit, treat or dispose of sewage
- Waste disposal sites

Note: this table has combined similar types of activities which are identified in the regulation as distinct prescribed drinking water threats.

Section Summaries - *The Assessment Reports for the Thames-Sydenham Region are large summary documents compiling information from many technical reports. These technical reports include Water Budgets, Watershed Characterization Reports and many SP Technical Studies related to municipal drinking water systems. That information has been summarized and compiled into the Assessment Reports of the Region. Each section on the Assessment Reports has been summarized in a series of Section Summaries.*

Local Drinking Water Threats

The Clean Water Act also allows the Source Protection Committee to identify other activities which they consider threats to drinking water but are not listed in the MOE threats table referenced above. For activities identified in the MOE threats tables the Source Protection Committee can also identify additional circumstances under which they consider the activity a drinking water threat.

The Source Protection Committee has not identified any local threats or circumstances at this point. The SPC has concern over the risks associated with the transportation of materials through pipelines or other corridors. The SPC has also expressed a concern over the potential risk that geothermal systems pose to groundwater sources of drinking water.

Threats arising from Conditions

Conditions are a result of past activities. The type of situations that can be considered conditions are summarized in the Conditions Assessment Section of the Assessment Report. At the time of drafting of this Assessment Report, no Conditions have been identified for which the risk can be assessed, however a couple of potential conditions in the Lower Thames Valley Source Protection Area are being considered for further work. More work will be undertaken on identifying and assessing conditions and the Assessment Report will be amended if necessary.

Threats arising from Issues

A drinking water issue is a parameter or pathogen which is shown to deteriorate, or trends towards a deterioration of raw (untreated) water quality for the purposes of drinking. The issues identified in the Lower Thames

Thames-Sydenham and Region - Assessment Reports

Valley SPA are summarized in the Issues Evaluation Section of the Assessment Report. Should an issue be identified, the activities that contribute to the identified issue become a significant risk that must be reduced through the source protection plan. Further, the area and the activity contributing to a drinking water quality issue must also be identified. This work has yet to be completed and will be part of an amended Assessment Report. A work plan for this work is included in the Issues Evaluation section of the Assessment Report.

Risk Assessment

An activity may be determined to be a drinking water threat based on the vulnerable area it occurs in, the vulnerability score assigned to that area, the circumstance of the activity, and the hazard rating associated with the activity.

An activity can only be identified as a threat if it is occurring in a vulnerable area and the vulnerability score of the area is greater than 4. The circumstances under which the activity is undertaken are important in determining the level of risk associated with the activity in these areas. The circumstances to be considered include the type of material, the quantity of material and whether it might be released to surface water or groundwater. Each circumstance of an activity is assigned a hazard score. The MOE has developed "Tables of Drinking Water Threats" which identify the level of risk associated with an activity in a vulnerable area. These MOE threats tables contain two tables for activities related to chemicals and those related to pathogens.

The risk score is calculated by multiplying the vulnerability score assigned to a vulnerable area with the hazard rating of the activity. An activity is then deemed to be a significant, moderate or low threat depending on the calculated risk score. The tables include the results of this calculation and identify the risk level associated with an activity based on the vulnerability score of the area in which the activity is being undertaken.

In general, risk scores of 40 or below, generate no threats. Risk scores greater than 40 to 60 result in low threats, while risk scores above 60 up to 80 result in moderate threat levels and those 80 or greater are significant threats. Some exceptions include issue-based threats which are deemed significant regardless of the vulnerability area and score, and activities related to

Dense Non-Aqueous Phase Liquids (DNAPLs) which are significant threats in well head protection areas A (100 m radius), B (2 year capture zone excluding A), and C (2 to 5 year capture zone).

Under the Clean Water Act, it is required to determine the number of locations at which a significant threat may occur. Also, a list of activities which are or "would be" threats are to be included. Generally this is addressed by including all activities listed in the prescribed lists even if they are not being engaged in an area. Activities not currently being undertaken in the vulnerable areas "would be" threats if the activity was to be undertaken in the vulnerable area in the future. The circumstances which result in them being significant threats must also be included in the Assessment Reports. These lists are provided in a series of tables included in the Threats and Risk Assessment section of the Assessment Report.

In the Thames-Sydenham and Region, the threat and risk assessment work was done according to the Threats and Risk Assessment Local Guidance Version 1.2 (September 9, 2009), which provides clarification and local interpretation of the sections in the Clean Water Act, its regulations and the associated technical rules pertaining to the threats and risk assessment.

Table 2 provides the number of locations at which a significant threat may occur within the intake protection zones and well head protection areas of the Lower Thames Valley SPA.

Maps such as those illustrated in Figure 1 and 2 show the areas within intake protection zones and well head protection areas in the Lower Thames Valley SPA where activities are or could be drinking water threats.

Thames-Sydenham and Region - Assessment Reports

Figure 1 Areas where activities are or would be threats in an Intake Protection Zone

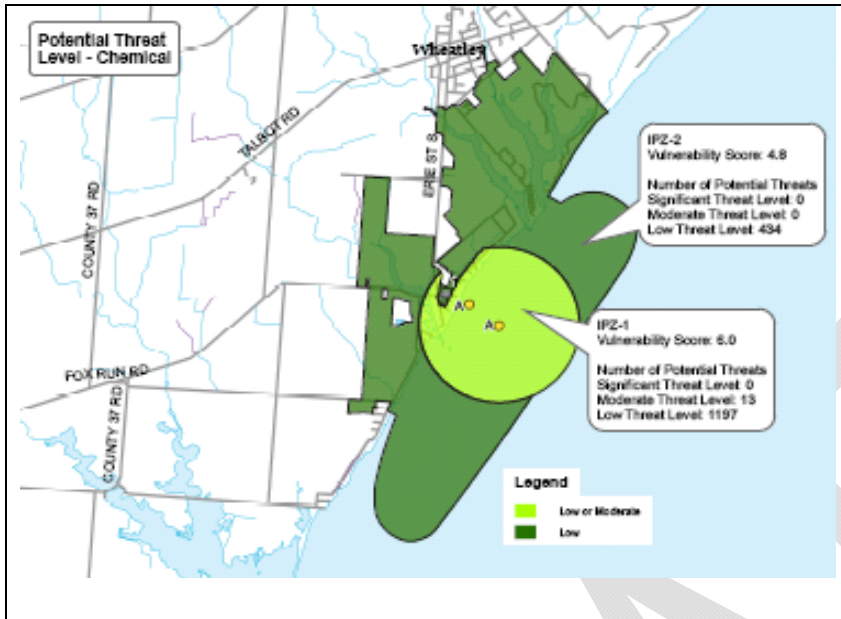
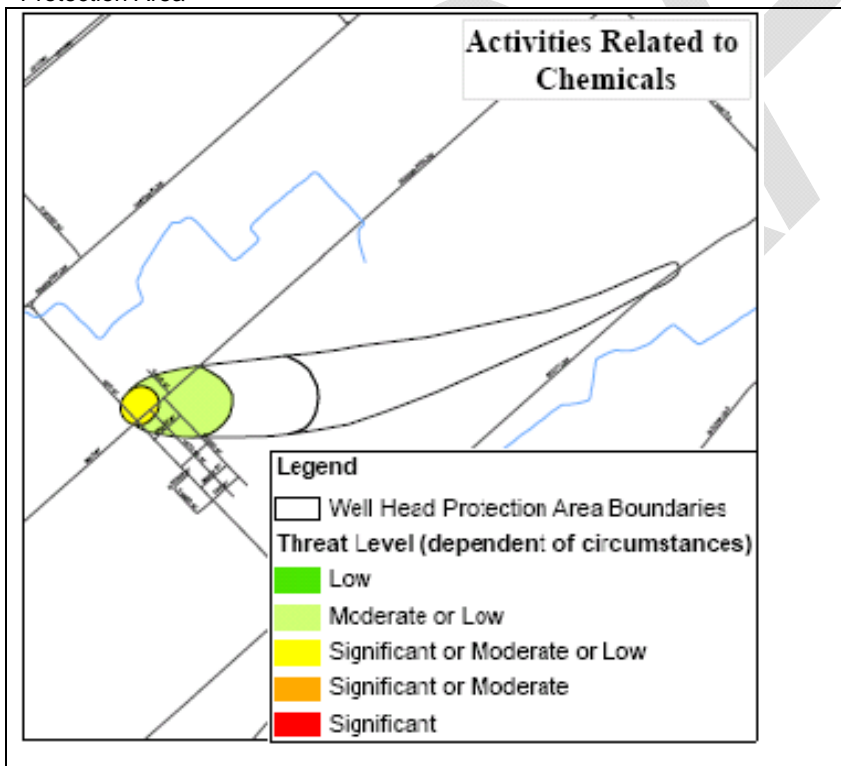


Table 2: Number of Locations of Significant Drinking Water Threats in the Lower Thames Valley SPA Vulnerable Areas

System and Vulnerable Area	Vulnerability Score	Significant Threat Locations
Highgate Well Supply System		
WHPA - A	10	42*
WHPA - B	6	0
WHPA - C	4	0
WHPA - D	2	0
Ridgetown Well Supply System - Erie Street wells		
WHPA - A	10	30*
WHPA - B	6	2*
WHPA - C	2	0
WHPA - D	2	0
Ridgetown Well Supply System - Scane Road wells		
WHPA - A	10	1*
WHPA - B	6	0
WHPA - C	2	0
WHPA - D	2	0
Wheatley Water Treatment Plant – Primary Intake		
IPZ-1	6.0	0
IPZ-2	4.8	0
Wheatley Water Treatment Plant – Emergency Intake		
IPZ-1	7.0	0
IPZ-2	5.6	0
Chatham/South Kent Water Treatment Plant		
IPZ-1	5.0	0
IPZ-2	4.0	0
West Elgin Water Treatment Plant – Primary Intake		
IPZ-1	6.0	0
IPZ-2	4.2	0
West Elgin Water Treatment Plant – Emergency Intake		
IPZ-1	7.0	0
IPZ-2	Not determined	0

Figure 2 Areas where activities are or would be threats in a Wellhead Protection Area



*Does not include possible threats associated with the application of agricultural and non-agricultural source material to land, and the application of commercial fertilizer and road salt to land