Overgrown Bacteria

Although several different definitions of “overgrown bacteria” exist amongst environmental microbiological testing laboratories, the common definition cites “… the crowding and/or confluent and/or non-identifiable microbial growth on a plate.” Recently, the Ministry of the Environment expanded the list of qualifiers in eDWIS addressing NDOG (NO DATA; OVERGROWN). The summary of new qualifiers is provided in Table 1.

Should a licensed laboratory perform total coliform background analyses, clearly identifies and detects >200 CFU/100mL TCB colonies on a microbial plate, there is NO REQUIREMENT to verbally or electronically report these results as “adverse” or “NDOGxx” to the appropriate authorities.

Where an observation of “over-crowding/confluent/non-identifiable microbial growth” is detected on a plate relating to analyses under the SDWA, licensed laboratories ARE REQUIRED to report the results to the appropriate parties specifically noting such observations for the determination of corrective actions by the authorities.

<table>
<thead>
<tr>
<th>QUALIFIER</th>
<th>QUALIFIER MEANING</th>
<th>OLD STATUS IN eDWIS</th>
<th>NEW STATUS IN eDWIS</th>
<th>AFFECTED PARAMETERS</th>
<th>MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDOGN</td>
<td>NO DATA; TOTAL COLIFORM PLATE OVERGROWN W/NONTARGET</td>
<td>Exceedance flag only for TC</td>
<td>Exceedance flag for EC and TC; no data</td>
<td>EC and TC</td>
<td>DC</td>
</tr>
<tr>
<td>NDOGT</td>
<td>NO DATA; TOTAL COLIFORM PLATE OVERGROWN WITH TARGET</td>
<td>Exceedance flag only for TC</td>
<td>Exceedance flag for EC or TC; no data</td>
<td>EC or TC; the target may be different depending upon the agar used</td>
<td>DC</td>
</tr>
<tr>
<td>NDOGEC</td>
<td>NO DATA; E. COLI PLATE OVERGROWN</td>
<td>Not available</td>
<td>Exceedance for EC; no data</td>
<td>EC only</td>
<td>EC</td>
</tr>
<tr>
<td>NDOGTC</td>
<td>NO DATA; TOTAL COLIFORM PLATE OVERGROWN</td>
<td>Not available</td>
<td>Exceedance for TC; no data</td>
<td>TC only; TC selective media only</td>
<td>mEndo</td>
</tr>
<tr>
<td>NDOGHPC</td>
<td>NO DATA; HPC PLATE OVERGROWN WITH TARGET</td>
<td>Not available</td>
<td>No exceedance; no data</td>
<td>HPC</td>
<td>_</td>
</tr>
</tbody>
</table>

The purpose of this update is to provide clarification on how the ministry interprets certain sections of the Safe Drinking Water Act, 2002 (SDWA) and the Health Protection and Promotion Act and their regulations in order that all licensed laboratories have a common understanding of the requirements, that no laboratory is mistakenly deemed out of compliance, and to ensure safe drinking water in Ontario. The following technical clarifications have been approved by the Assistant Director, Safe Drinking Water Branch, Drinking Water Management Division, Ministry of the Environment and as such, by way of this bulletin, shall be considered for the purpose of assessing compliance until such time that this bulletin is amended or revoked. Laboratory Update Bulletin, Issue #1 - June 2004, is revoked.

For Inquiries Contact:
Ministry of the Environment
Safe Drinking Water Branch
Laboratory Licensing and Compliance Program
125 Resources Road, Toronto, ON, M9P 3V6
Tel: 416-235-6370  Fax: 416-235-6519
Immediate Reporting of Adverse Test Results

In the Ministry’s Laboratory Bulletin Issue #1 (June 2004), the term “immediate”, with respect to adverse test results was interpreted as “for the purpose of reporting adverse drinking-water quality results means the process of reporting the adverse result is initiated when authorized for release, without delay from any another action and in accordance with an MOE approved procedure. The laboratory must have a written procedure for authorization of an adverse test result for release, which shall be inspected by MOE to ensure it is acceptable.”

All licensed laboratories are required to document and incorporate the following policies:

- There must be no undue delay during the analytical processing of a drinking-water sample at a licensed laboratory (see Table 2 below).
- Once an adverse test result is accepted by qualified staff of a licensed laboratory, there must be no undue delay by any other activity in reporting the adverse test result to the Local Medical Officer of Health (LMOH) at the Public Health Unit, the Ministry of the Environment - Spills Action Centre (MOE-SAC), and the associated drinking-water system (DWS) owner/ operator as appropriate.

Licensed laboratory staff analyzing drinking-water samples must:

- Adhere to documented training requirements and policies for determining/comparing test results against the Ontario Drinking Water-Quality Standards (O. Reg. 169/03) and/or limits specifically cited in Ministry drinking-water legislation.
- Develop, document, and adhere to, laboratory policies/ procedures relating to the business processes described in Stages i-ix in Table 2.
- Document and adhere to the same immediate adverse test result reporting time-frames for chemical testing as are in place for microbiological testing and specify in laboratory policies and procedures (i.e. there must be no undue delay in the reporting of any adverse test results to the appropriate authorities).

<table>
<thead>
<tr>
<th>Stages/ Decisions – Recognition and Reporting Adverse Test Results by a Licensed Laboratory</th>
<th>Stage</th>
<th>Controlling Lab Activity</th>
<th>Time Allowance</th>
<th>Statute</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Receive and identify sample as drinking water</td>
<td>Staff resources</td>
<td>Holding time clock starts at time of sampling noted on Chain of Custody/Submission form</td>
<td>O. Reg 248/03 s. 10(1)</td>
</tr>
<tr>
<td>ii</td>
<td>Process sample for analysis</td>
<td>Staff resources/process</td>
<td>Process-time that the analysis requires</td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>Analyze sample, record signal from instrument</td>
<td>Analyst/analytical method run-time</td>
<td>Run-time the instrumentation requires</td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>Convert instrument signal to concentration or other calculation</td>
<td>Analyst</td>
<td>(1) time the software/hardware requires analyst interpretation/verification of raw data, if necessary (direct reading vs calculation against calibration) (2) calculation of aggregated results</td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>Check that quality control (QC) meets specifications</td>
<td>Analyst/IT process</td>
<td>No delay by any other activity</td>
<td>Information technology (IT) not allowed to delay the process</td>
</tr>
<tr>
<td>vi</td>
<td>Approve and compare result against standard to determine if test result is adverse</td>
<td>Analyst/Supervisor/IT process</td>
<td>No delay by any other activity</td>
<td>Information technology (IT) not allowed to delay the process</td>
</tr>
<tr>
<td>vii</td>
<td>Adverse test result immediately approved for release by analyst/reported to supervisor</td>
<td>Analyst/Supervisor approval</td>
<td>No delay by any other activity</td>
<td></td>
</tr>
<tr>
<td>viii</td>
<td>Verbal report of adverse test result to LMOH, MOE-SAC, DWS owner/operator, PHU as applicable</td>
<td>Staff resources</td>
<td>No delay by any other activity</td>
<td>SDWA, c.32, s. 18 (1) and (4), 18.1 (1) and (3)</td>
</tr>
<tr>
<td>ix</td>
<td>Written report of adverse test to LMOH, MOE-SAC, DWS owner/operator, PHU as applicable</td>
<td>Staff resources</td>
<td>No greater than 24 hours from verbal report (section viii) (where only verbal report is required)</td>
<td>O. Reg. 170/03 16-7, (2), O. Reg. 243/07 s.6 (1), O. Reg. 318/08 4-5 (1)</td>
</tr>
</tbody>
</table>
Duplicate Data

The following guidance is for licensed laboratories which analyze drinking water samples in duplicate:

- Ensure that all quality control (QC) criteria is appropriately documented and understood by analysts.
- Ensure that prescribed QC criteria are met when analyzing regulated drinking-water samples.
- Ensure that duplicate analyses are not averaged for the purpose of notification and reporting under the SDWA.
- Ensure that an Adverse Water Quality Incident (AWQI) is reported to the appropriate authorities if found in either the first or second aliquot of a duplicated drinking-water analysis (see Table 3).

- Laboratories shall not differentiate between a sample and the associated duplicate sample (second sample) with respect to notification and reporting of duplicate results for drinking water analyses.
- Where an AWQI is reported to MOE-SAC/LMOH/DWS owner/operator for one aliquot of a sample where 2 aliquots were tested by the microbiological Presence/Absence (P/A) technique and a confirmed positive in the second aliquot is observed after the first aliquot has been reported, **DO NOT** report the second aliquot result to MOE-SAC/LMOH/DWS owner/operator. The second aliquot result is **NOT** uploaded to the MOE eDWIS or MOHLTC LRMA.

---

**Table 3**

<table>
<thead>
<tr>
<th>Duplicate Data Reporting Criteria</th>
<th>Laboratory Notification to Appropriate Parties</th>
<th>Uploading Duplicate Data to MOE eDWIS and MOHL-TC LRMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both Results are AWQI</td>
<td>• Inform MOE-SAC/ LMOH/ PHU/DWS owner/operator (as appropriate) that the sample was tested twice • Duplicate results are BOTH AWQI • Request that MOE-SAC/ PHU note in MOE eDWIS/ MOHL-TC LRMA that the samples were analyzed in duplicate and that the HIGHER result of two results be identified as the AWQI</td>
<td>Upload the HIGHER result in MOE eDWIS/MOHL-TC LRMA</td>
</tr>
<tr>
<td>ONE Result is AWQI and the other is non-AWQI</td>
<td>• Inform MOE-SAC/ LMOH/ PHU /DWS client that the sample was tested twice and that one result is AWQI • Request that MOE-SAC/PHU note in MOE eDWIS/MOHL-TC LRMA that the sample was tested twice by the lab and one result was AWQI</td>
<td>Upload the AWQI result to MOE eDWIS/ MOHL-TC LRMA</td>
</tr>
<tr>
<td>BOTH Results are non-AWQI</td>
<td>No notification required</td>
<td>Upload a result in MOE eDWIS/ MOHL-TC LRMA</td>
</tr>
</tbody>
</table>

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Data Reporting

The ministry requires that data reported to the laboratory’s clients for samples analyzed under the SDWA meet the following requirements:

- be produced by appropriate licensed and accredited analytical methods;
- be numerically identical to any data reported to SAC/LMOH/DWS owner/operator and uploaded to DWIS/LRMA;
- meet the MOE reporting detection limit (RDL) requirements where applicable;
- be expressed in appropriate and defensible significant figures; and,
- be expressed by two to three significant figures for the expression of chemical data.

The ministry expects that the process or system that reports data for the purpose of complying with the requirements of the SDWA be validated with respect to transmission error and content.

- analytical results provided for the purposes of the SDWA should be reported down to the licensed method’s method detection limit (MDL) value but are not required to be;
- analytical results must be reported down to the MOE Reporting Detection Limit (RDL); and,
- analytical results provided to proficiency testing (PT) programs required for accreditation purposes or provided by the MOE must be reported down to the method’s MDL value.

The ministry requires that laboratories have procedures in place to ensure that data transfer mechanisms and routines, both manual and electronic, are checked for errors.

Schedule 13-5 of O. Reg. 170/03 requires increased frequency of sampling if an analytical result obtained for any of the parameters listed in Schedules 23 or 24 exceeds one...
The minimum requirements for approval by the Director for a chain of custody or submission form are that they contain the following fields and that they be traceable as to origin and laboratory approval status. These requirements may be assessed at the laboratory at the time of inspection.

Chain of custody/submission forms which are Director-approved meet the following criteria:

- Drinking Water System name, number, and physical address
- Drinking Water System contact name, and telephone number
- Identification of the laboratory, including name, address, telephone number
- Identification of the regulation that applies to the sample(s)
- Sampler identification – name and signature
- Samples submitted by – name and signature
- Sample location name
- Sample location type (DWIS location, water type - raw, treated, distribution)
- Date and time of sampling
- Chlorine residual
- Requested parameters (i.e. E. coli, metals)
- Laboratory reception - signature, date, time and Unique identifier for the form.

There may be occasions when a laboratory is asked to accept, by a client, the use of a chain of custody form or sample submission form that is not generated by the laboratory for the submission of drinking water samples. Under O. Reg. 248/03, the form of these records of acceptance must be approved by the Director. Fulfillment of this requirement is assessed as part of the laboratory licensing and inspection process. If the laboratory agrees to use a client-generated chain of custody or submission form it must:

1. Review and pre-approve the chain of custody form as being fit for the laboratory’s use for drinking water samples.
2. Retain documentation of having done so and
3. Be prepared to have the client chain of custody form assessed at the next inspection.

MOE RDL requirements are not intended to imply reporting increments or number of required significant figures.
Reporting Adverse Water Quality Results in the Event of Suspected Laboratory Sample Contamination/Interferences

Where a licensed laboratory reasonably believes that an adverse result may be erroneous due to laboratory sample interference/contamination, but not as a result of QC failure, the laboratory shall:

a. Document all details relating to the possibility of result error on the analyst worksheet, logbook, final reports, etc.
b. Report the adverse result to all appropriate parties as required, indicating that the result is PROVISIONAL UNTIL FURTHER NOTICE due to the possibility of interferences/contamination associated with the result.
c. If the issue is not resolved within 24 hours, a written report is required providing details in writing to all appropriate parties.
d. Immediately take and document steps to investigate the possibility of interferences/contamination, requesting a re-sample, if necessary.
e. Keep MOE-SAC/PHU/LMOH/DWS owner/operator updated on the laboratory’s internal investigation providing a completion time where warranted.
f. Once the result has been confirmed, notify all parties (MOE-SAC, PHU, LMOH and the DWS owner/operator) of the confirmed result and, where applicable, the reason for the error/contamination.
g. Record all steps taken in the appropriate documents.

Correcting Erroneous Data Reported to the MOE or MOHLTC

Where a lab has reported erroneous data the lab shall:

1. Document all details pertaining to the erroneous data
2. Contact appropriate parties, where applicable.
   a. If the erroneous result was reported as an Adverse Water Quality Incident, verbally contact SAC, DWS owner/operator and LMOH, where appropriate, and RETRACT the erroneous result. Provide details about the error and the correct result.
   b. Provide written notification to the appropriate parties indicating the retraction of the erroneous data directly on the ministry’s “Notice of Adverse Test Results and Other Problems and Notice of Issue Resolution at Drinking Water Systems” form. Include the correct result.
3. If the data has been uploaded to ministry databases the lab shall:

MOE eDWIS:

Contact the Help Desk at opssd@ontario.ca or by calling the help desk at 1-888-677-4873. Request the removal of the erroneous data, including the sample submission ID that used to upload all erroneous results. Upload correct results and any other results that were inactivated within the submission ID to eDWIS. The Help Desk can also assist for issues such as data correction (delete lab sample submission(s)), upload issues, DWIS technical assistance or regulatory requirements.

NOTE: All results uploaded under the submission ID will be inactivated in DWIS.

NOTE: A new submission ID must be used to upload the results. We encourage labs to use the same submission ID used to upload the original data appended with an A, i.e., original submission ID 123456 will be re-uploaded as submission ID 123456A.

MOHLTC LRMA:

Log onto LRMA and toggle the “ignore” button to “TRUE”. Upload the correct result under a new submission ID.

If necessary contact the LRMA help desk at iphissupport.moh@ontario.ca or by calling 1-866-272-2794

Testing and Reporting of Aggregated Parameters

The SDWA requires that licensed laboratories hired to perform regulated drinking water analyses are required to report all of their regulated data to DWIS within 28 days of data approval.

In the case where aggregated parameter data are to be reported to eDWIS, the Ministry requires that the “total” sum of the aggregate be reported, not individual parameters. Laboratories licensed and hired to perform the analyses of various aggregated parameters (i.e. Aldrin + Dieldrin, DDT + metabolites, etc.) must be licensed to analyze ALL parameters of that specific aggregated test.

In order for laboratories to meet their reporting obligations, the SDWA requires that the “total” analyses be done at one laboratory licensed to test all of the aggregated parameters.

Currently, the accreditation bodies do not accredit calculated parameters, although the MOE will licence them.
Uncertainty and Reporting Adverse Test Results

Estimation of the analytical uncertainty of a measurement is a requirement of ISO/IEC 17025:2005 – General Requirements for the Competence of Testing and Calibration Laboratories and must be available if requested by the client. However, uncertainty does not provide a basis for either reporting or not reporting adverse test results. The reported result must be reported where it qualifies as an adverse test result.

Licensed laboratories shall report adverse water quality results as per the drinking water legislation without any regard to calculated uncertainty estimations.

Recent Changes in O. Reg. 248/03

Please note, on December 14, 2009 the MOE amended O. Reg. 248/03 to expand the definition of tests at drinking water systems that do not require a drinking water testing licence (Reg. 248/03 s. 2).

Also the Ministry of the Environment introduced a new form entitled “Notification Form for Drinking Water Testing Research and Method Development” (Form 2052E) in accordance with Section 5 of O. Reg. 248/03. This form allows organizations to perform research and method development on drinking water provided that they inform the Ministry of the Environment.

Adverse Reporting Change in O. Reg. 170/03

The adverse reporting period for sodium and fluoride made under Schedule 16-3 s. 1 (8) and (9) ii was recently amended from a 60 month adverse reporting period to 57 months.

Co-located Samples under O. Reg. 243/07

Facilities are co-located if more than one school, private school or day nursery share the same plumbing. In most cases, facilities that share a building can be considered co-located. Co-located facility operators may share a single set of samples, provided that the sampling is being done properly.

The operator who has agreed to flush and/or take samples for all facilities is referred to as the primary facility operator. For example, if a school and a day nursery are co-located, the school (primary facility) may take one set of samples to satisfy the sampling requirements of both the school and the day nursery. The day nursery is referred to as the secondary facility.

When a decision is made to share samples among multiple facilities, all participants should submit an updated Registration and Laboratory Services Notification form to the MOE.

Sample results submitted by co-located facilities should only report to the primary facility DWS number. If the test result for a shared sample exceeds the Drinking Water Quality Standard for lead, the Notice of Lead Exceedence Test Results (LEN) form should be sent to the primary operator. Likewise, when the laboratory submits the LEN to MOE-SAC and uploads the results to eDWIS, only the primary DWS number should be referenced.

Please note that the following MOE documents have been rescinded and replaced with this document:

- Adverse reporting of “overgrown bacteria” (dated July 12, 2006)
- Laboratory Inspection Report – Amendment (Immediate Reporting of Adverse Test Results) (dated February 6, 2006)
- Ministry of the Environment (MOE) Duplicate Data Reporting Protocol For Licensed Laboratories Analyzing Ontario Drinking-Water Samples (version 1.0 March 2005)
- Upcoming Ministry Laboratory Inspections – Cycle 7 (dated June 20, 2007)
- Cycle 7 Inspection 2007-2008 (dated June 7, 2007)
- Important Notice to All Licensed Laboratories – Requirement Retraction (dated March 10, 2005)
- Reporting Adverse Water Quality Results in the Event of Suspected Laboratory Sample Contamination/Interferences (dated June 10, 2006)
- Chain of Custody Approved by the Director (dated May 17, 2007)
- New Drinking Water Licence Condition and Request for Information dated (March 24, 2006)
- New Licence Condition (dated October 24, 2005)