User Guide

For the Collection and Submission of Water Samples

Ministry of Environment - Chemistry Laboratory
Dorset, Ontario

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www.desc.ca

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Introduction

This guide is intended for use mainly by scientists, supervisors, and field sampling crews submitting samples to the Dorset Chemistry laboratory. All groups intending to send samples to the Dorset Chemistry lab should obtain a test load, (the number of samples and type of sample allowed) and ***approval*** from the current lab supervisor (presently jim.rusak@ontario.ca) before field sampling begins for the year. Sampling staff are encouraged to visit, email or phone the Dorset submission entry clerk (presently Cathy Thomson), to be provided with a customized submission form. The lab is currently configured to process primarily surface water samples from central Ontario lakes. Please enquire if you plan on submitting other types of samples. A list of all available chemical analyses that can be performed by the Water Chemistry Laboratory can be found in Section 11.

The first step in ensuring quality results is the process of taking the sample correctly. Make sure that the proper technique is understood before you sample! For a complete discussion of sampling methodologies used in Dorset Environmental Science Centre (DESC) long-term monitoring programs please consult the following manuals. ***Lake Sample Collection Methods-Final edits.doc*** for lake sampling techniques (G:\Programs\Inland Lakes\Lake Documents\ - contact: Ron Ingram) or ***Hydrometeorology Sampling Methods.doc*** for stream and precipitation sampling (G:\Programs\Inland Lakes\Lake Documents\ - contact: Chris McConnell). For a general overview, please refer to the section "Basic Instructions for obtaining water samples for chemical analyses".

Chemistry results are archived in our Dorset Oracle Database (Dorset Data Store). The evolution of the sample submission form has transformed it into the best method to load sample information to our Oracle database. It can not be stressed enough how important it is to create digitally correct submission forms. These forms are to be populated in Excel. Mobile handheld devices such as Palm Pilots or Tablet computers can be also be used to fill in the forms. The form used, will depend on whether or not you are sampling a lake, stream or collecting precipitation samples. There is also a special form for samples originating in a Laboratory. E.g. FLAMES lab or Waterloo lab. Please refer to the section "Detailed Instructions for Completing the Sample Submission and Field Data Forms" for specific instructions on completing forms for the various types of sampling.

The latest version of this guide can be found at: G:\General\Sample submission

A) Basic Instructions for obtaining water samples for chemical analyses

The intent of this section of the guide is to highlight the practical aspects of obtaining a water sample that will yield the best water chemistry results, irrespective of whether the sample comes from a lake, stream, precipitation collector or underground aquifer. As such, users should also seek instruction from the lead scientist on the project being sampled for details on the sampling procedure for their particular system of interest.

1. **Ensure you can store samples properly once you collect them** – A cooler with freezer packs and a test tube rack is the preferred method of transport as the samples should be kept cool. If sampling in more rugged terrain, keep the glass sample containers in their foam wraps and make sure samples remain upright with the help of suitable packing material. Ice can be used if placed on the cooler bottom and samples are isolated from it, but contamination can occur if sample containers come into direct contact with meltwater.
2. **Use non-powdered vinyl gloves** – To avoid washing any of your personal chemistry into the sample bottle, samplers must obtain their sample with gloves on their hands. Please change gloves when you change waterbodies.
3. **Make sure you will have a valid StationID** - If you're sampling a new station that hasn't been sampled before make sure you collect latitude and longitude (NAD83-UTM Zone17N) with a GPS (or find out the lat/long of where you were once back in the lab with GoogleEarth or FlashEarth).
4. **Filter** - Most samples need to be filtered through an 80µm mesh prior to collection in the sample container irrespective of whether they originate from lake, stream, precipitation or groundwater sampling. The only samples for which this is not the case are DIC/TIC/TOC and pH/alkalinity (see appendix 12 for photos). Because carbon is dissolved in water as CO_2, introducing oxygen to the sample via filtration is not advisable. pH is also affected by exchange of CO_2 when the water sample is not in equilibrium with the atmosphere.
5. **Rinse sample containers three times -** Including sample container caps. Additionally, the filter apparatus also needs to be rinsed three times prior to the acquisition of the first water from a particular sample.
6. **No air in DIC/TIC/TOC and pH/alkalinity samples** – For the reasons stated above, these samples should have no air bubbles in the container. Invert to check in transparent containers.
7. **Fill phosphorus tubes correctly** – Water height should above the etched line, but no more than 1 cm above.
8. **Do not fix water samples in the field** – This is particularly true for samples to be analyzed for metals – high grade nitric acid needs to be used for these samples and this grade is not readily available. There may be occasions where chlorophyll samples need to be fixed to avoid perishability limits, but please see the lab if you think this might be a problem.
9. **Sample with care** – Do not disturb the water column (sample from the surface to the bottom) or stream substrate (discard rinse water downstream) unnecessarily when sampling. Ensure unfiltered samples are free from debris.
10. **Ensure samples are properly labeled -** the description on the bottle should match the description on the sample submission sheet.
11. **Submit samples properly to the Chemistry Laboratory** – Smile. Gifts of chocolate are always welcome. If after hours, please properly refrigerate samples until they can be submitted the following morning (also see detailed instructions below).

B) Detailed Instructions for Completing the Sample Submission and Field Data Forms

Every sample submitted to the lab for analysis must be accompanied by a properly completed sample submission form containing the appropriate data describing that sample or it will not be processed. Those data are initially illustrated with reference to a lake sample submission, but the fields that require completion are the same for all other types of samples and examples of those forms follow this initial illustration.

1. Lake Samples

Below is an example of what a typical lake submission sheet would look like with the fields that need modification highlighted in light green. No new columns are to be added, or deleted, but more rows are acceptable. Cyan shaded sections are filled in by the lab. Project Submission forms (Excel 2003 format) will be emailed to you at the start of the sampling season or if access to the Dorset File Server is possible, can be found here: ***G:\General\SampleSubmission\COMPLETED_FORMS***

Date Submitted: 19-Nov-2009
Form Type: LAKES

Sampled by: Ron Ingram
Submitted by: Ron Ingram
Sub Description: A Lakes

SUBNUM:
DORNUM:

Client ID: 4376 2
Program Code: 01701

WHMIS	
HEALTH	0
FLAMMABILITY	0
REACTIVITY	0
PROTECTION	0
POTENTIAL HAZARD	HEALTH
FIELD SAMPLE IDS	All

LOGIN ID

Client Contact
Name: Johnny Su
Address: DESC, Bellwood Acres Rd, Dorset, P0A 1E0
Phone: 705-766-1291

LAB SAMPLE NUMBER	Sample Set#	Cont Sent	STATION	DATE dd-mmm-yyyy	TIME hh:mm	LDESC	PARENT PRODUCT	PRODUCT
C???????-0001	1	5	0 3 0 0 7 7 5 1 0 0 1	19-Nov-2009	11:05	CN W	DRCLKA	MET 3386
C???????-0002	1	1	0 3 0 0 7 7 5 1 0 0 1	19-Nov-2009	11:05	CN W		TP 3036
C???????-0003	2	1	0 3 0 0 7 7 5 1 0 0 1	19-Nov-2009	11:05	CN EUPH	DRCCHLO	

The Field data part of the submission sheet will look something like this:

FIELD DATA PORTION

See Sample Submission Manual for proper codes

SPECIAL STUDY_ID	SAMPLE GEAR_TYPE	SAMPLE TYPE	WLAYER	SDEPTH	BGDEPTH	WDEPTH	SECCHI	SDESC
47	2	12	1	0	19	20	2.5	Light rain
47	2	12	1	0	19	20	2.5	Light rain
47	2	12	5	0	5	20	2.5	Light rain

The highlighted fields in light green generally need to be completed; SDESC can remain blank.

Form Completion Instructions:

Ensure that every sample container is labelled with either a Field Sample ID or a Sample location description (Text that is in the LDESC field - e.g., CN-W)

Accurately fill out the following fields at the top of the form:
a. **Date Submitted** = submission date in (dd-mmm-yyyy) format.
b. **Sampled by** and **Submitted by** = sampler name

Accurately fill out the following cells in the form table:
c. **Sample Set#** = numeric (Beginning at 1) - VERY IMPORTANT - the sample set identifier is intended to provide a way of retrieving replicate samples that have been taken at the same time and location. If samples are identical but are taken for different parameters then they may require a different sample set number (e.g., a lake composite sample for Total Phosphorous is one sample set number and a lake composite sample for chlorophyll will be another sample set number), but generally when the samples are taken from the same water sample or pumped from the same depth the Sample Set# is not incremented.
d. **Cont. Sent** = numeric – number of containers submitted for that sample.
e. **STATION** = Alphanumeric Identifier - See database manager (currently Johnny Su: johnny.su@ontario.ca) for the creation of unique station ID codes for your project.
f. **DATE** and **TIME** = time of sampling - Date format as above, time in 24 hour clock.
g. **LDESC** = Location Description. A short or abbreviated description of where the sample originated. E.g. PC-Epi or PC-W. Please ensure that this identifier is entered in the same manner from now on (i.e., if PC-W is entered with no spaces and a dash, DO NOT insert spaces or remove the dash).
h. **PARENT PRODUCT** and **PRODUCT** = Alphanumeric Identifier - Unique Code to identify the tests that you require. See Section 10 below.
i. **SPECIAL STUDY_ID** = Numeric Identifier - Mandatory field. See database manager or sample submission clerk for a new SSID if you do not already have one. Please email a thorough written description of your project to the database manager (johnny.su@ontario.ca) when obtaining a new Special Study ID.
j. **Field Data**: Columns U – AB. Fill in whenever possible - projects are strongly encouraged to submit these data along with their chemistry data. See section 5 below for explanations.

The Excel file is to be saved with a descriptive name followed with the date in MMDDYY format. E.g. Crosson_01_19_10.xls. The file should also be in the Office 2003 format (xls).

Sample Submission to Chemistry Laboratory

Samples are to be left on the counter in the sample reception trailer. (Building 18), during the day and refrigerated if after 4:00 pm. Samples will normally be accepted only Monday to Thursday. However, if samples could not be submitted in time on Thursday, or are collected early Friday morning, they can be accepted until noon on Friday. If leaving samples in the refrigerator after hours, be sure to submit your completed submission form *before* going to the field on the next day.
Samples should be placed in order on the counter as they appear on the submission sheet, from left to right.
If there were any bottles that did not get filled or the bottle was misplaced in the field, then place a note with the submission on the counter, or in the cooler. The lab will decide to pour or re-pour the missing bottles for analysis.

Completed submission forms should be available for the sample submission clerk to review on the Dorset file server in ***G:\General\SampleSubmission\COMPLETED_FORMS/ "Your Project"/current submissions,*** just before the samples arrive at the lab. The clerk, through LIMS, will assign a submission number ("C" number), catalogue the samples, and queue the analysis.

For those groups who are submitting samples in coolers shipped by Purolator please send your completed submission forms to the submission clerk by email (cathy.thomson2@gmail.com).

2. Stream Samples

Date Submitted: 12-Jan-2010
Form Type: STREAMS

Client ID: 43762
Program Code: 01707 02

Client Contact
Name: Johnny Su
Address: DESC, Bellwood Acres Rd, Dorset, P0A 1E0
Phone: 705-766-1291

Sampled by: Christoper McConnell
Submitted by: Christiane Guay
Sub Description: A Streams

WHMIS	
HEALTH	0
FLAMMABILITY	0
REACTIVITY	0
PROTECTION	0
POTENTIAL HAZARD	HEALTH
FIELD SAMPLE IDS	All

SUBNUM:
DORNUM:

LOGIN ID

LAB SAMPLE NUMBER	Sample Set#	Cont Sent	STATION	DATE dd-mmm-yyyy	TIME hh:mm	LDESC	PARENT PRODUCT	PRODUCT
C??????-0001	1	5	0308855340 2	11-Jan-2010	11:15	CB0L	DRCSTRMB	(+)Met3386
C??????-0002	1	1	0308855340 2	11-Jan-2010	11:15	CB0L		(+)TP3036
C??????-0003	2	5	0308855310 2	11-Jan-2010	14:30	CB1	DRCSTRMB	(+)Met3386
C??????-0004	2	1	0308855310 2	11-Jan-2010	14:30	CB1		(+)TP3036
C??????-0005	3	5	0308855320 2	11-Jan-2010	10:30	CB2	DRCSTRMB	(+)Met3386
C??????-0006	3	1	0308855320 2	11-Jan-2010	10:30	CB2		(+)TP3036

FIELD DATA PORTION

See Sample Submission Manual for proper codes

SPECIAL STUDY_ID	SAMPLE GEAR_TYPE	SAMPLE TYPE	STREAM TEMP	SDESC
46	1	11	0	Clear and -5C, partially frozen
46	1	11	0	Clear and -5C, partially frozen
46	1	11	0	Clear and -5C, complete ice and snow cover
46	1	11	0	Clear and -5C, complete ice and snow cover
46	1	11	0	Clear and -5C, deep snow and ice cover, beaver dam in place
46	1	11	0	Clear and -5C, deep snow and ice cover, beaver dam in place

3. Precipitation Samples

Date Submitted: 04-Nov-2009
Form Type: PRECIPITATION

Sampled by: Chris McConnell
Submitted by: Chris McConnell
Sub Description: Dorset Precip

SUBNUM:
DORNUM:

Client ID: 4 3 7 6 2
Program Code: 0 1 7 0 7 0 3

WHMIS	
HEALTH	0
FLAMMABILITY	0
REACTIVITY	0
PROTECTION	0
POTENTIAL HAZARD	HEALTH
FIELD SAMPLE IDS	All

LOGIN ID

Client Contact
Name: Johnny Su
Address: DESC, Bellwood Acres Rd, Dorset, P0A 1E0
Phone: 705-766-1291

LAB SAMPLE NUMBER	Sample Set#	Cont Sent	STATION	DATE dd-mmm-yyyy	TIME hh:mm	LDESC	PARENT PRODUCT	PRODUCT
-0001	1	4	1700215412 3	08-Oct-2009	12:30	PCP2 BULK COLLECT.	DRCPRECIP	Met3386
-0002	1	1	1700215412 3	08-Oct-2009	12:30	PCP2 BULK COLLECT.		(+)TP3036
-0003	3	4	0300085506 2 3	20-Oct-2009	13:10	HYP2 BULK COLLECT.	DRCPRECIP	Met3386
-0004	3	1	0300085506 2 3	20-Oct-2009	13:10	HYP2 BULK COLLECT.		(+)TP3036
-0005	5	4	0300085536 2 3	02-Nov-2009	16:00	PT1P BULK COLLECT.	DRCPRECIP	Met3386
-0006	5	1	0300085536 2 3	02-Nov-2009	16:00	PT1P BULK COLLECT.		(+)TP3036
-0007	6	4	0300085712 3	20-Oct-2009	12:05	HPP2 BULK COLLECT.	DRCPRECIP	Met3386
-0008	6	1	0300085712 3	20-Oct-2009	12:05	HPP2 BULK COLLECT.		(+)TP3036
-0009	7	1	9900030027 2 3	02-Nov-2009	18:00	QC DDW BLANK		(+)COND3024

FIELD DATA PORTION

See Sample Submission Manual for proper codes

SPECIAL STUDY_ID	SAMPLE GEAR_TYPE	SAMPLE TYPE	INITIAL DATE	INITIAL TIME	SDESC
49	9	62	21-Sep-2009	17:00	Sample has sat for extended period of time - use with caution
49	9	62	22-Sep-2009	18:00	Sample has sat for extended period of time - use with caution
49	9	62	25-Sep-2009	21:00	Sample has sat for extended period of time - use with caution
49	9	62	26-Sep-2009	22:00	Sample has sat for extended period of time - use with caution
49	9	62	29-Sep-2009	01:00	Sample has sat for extended period of time - use with caution
49	9	62	30-Sep-2009	02:00	Sample has sat for extended period of time - use with caution
49	9	62	01-Oct-2009	03:00	Sample has sat for extended period of time - use with caution
49	9	62	02-Oct-2009	04:00	Sample has sat for extended period of time - use with caution
49	9	62	03-Oct-2009	05:00	Sample has sat for extended period of time - use with caution

4. Laboratory Samples

Date Submitted: 21-Oct-2009
Form Type: LAB

Sampled by: C.T.
Submitted by: DORSET LAB
Sub Description: DORSET LAB

SUBNUM:
DORNUM:

Client ID: 4 3 7 6 2
Program Code: 2 0 0 0 3 0 3 0 1

WHMIS	
HEALTH	0
FLAMMABILITY	0
REACTIVITY	0
PROTECTION	0
POTENTIAL HAZARD	HEALTH
FIELD SAMPLE IDS	All

LOGIN ID

Client Contact
Name: Johnny Su
Address: DESC, Bellwood Acres Rd, Dorset, P0A 1E0
Phone: 705-766-1291

LAB SAMPLE NUMBER	Sample Set#	Cont Sent	STATION	DATE dd-mmm-yyyy	TIME hh:mm	LDESC	PARENT PRODUCT	PRODUCT
C??????-0001	1	1	99999DORLAB9	21-Oct-2009	14:55	C-01A-1		PHALK3042, COND3024, CAT3249, ANION3147,A MMNO3374,DORCSI3422
C??????-0002	2	1	99999DORLAB9	21-Oct-2009	14:55	C-01A-2		PHALK3042, COND3024, CAT3249, ANION3147, MMNO3374,DORCSI3422
C??????-0003	3	1	99999DORLAB9	21-Oct-2009	14:55	C-01A-3		PHALK3042, COND3024, CAT3249, ANION3147, MMNO3374,DORCSI3422
C??????-0004	4	1	99999DORLAB9	21-Oct-2009	14:55	C-01A-4		PHALK3042, COND3024, CAT3249, ANION3147, MMNO3374,DORCSI3422

5. Field Data - Explanations and Codes

SPECIAL
STUDY_ID — NUMERIC (integer) - Project ID assigned by Database Manager

SAMPLE TYPE — NUMERIC (integer) - Sample Type / collection method

	Method	***Origin of Water***
10	profile	lakes
11	grab sample (single depth)	lakes, streams
12	depth composite	lakes
13	time proportional composite	streams
14	flow proportional composite	streams
61	wet only collector	precip
62	bulk collector	precip
63	on ground snow	precip
71	groundwater sample	groundwater

SDESC — CHARACTER - sample description. Information about the sample that may help people reviewing the data interpret the results (e.g. pollen in sample). Indicate if a sample comes to the lab fixed here. Maximum 256 characters to be entered, including spaces. All on one line.

SDEPTH — NUMERIC (integer) - sample depth (in m) or top of composite for depth composite (SAMPLE TYPE = 12) samples

BGDEPTH — bottom depth (in m) of composite samples (SAMPLE TYPE = 12)

WDEPTH — NUMERIC (integer or decimal) – depth (in m) of water at sample location

WLAYER — NUMERIC (integer) – identifier for Lake Layer sampled

1	whole lake composite (spring and fall turnover)
2	epilimnion
3	metalimnion
4	hypolimnion
5	euphotic zone (surface to 2 x Secchi)
8	grab (Kemmerer etc. use with type = 11)
9	general layer (0-5 m composite etc.)

TEMP — NUMERIC (integer or decimal) - water temperature in degrees Celsius.

SAMPLE_GEAR _TYPE	NUMERIC (integer or decimal) – Gear Identifier		
	1	hand sample - bottle filled by hand	(all media)
	2	peristaltic pump	(lake/groundwater)
	3	Van Dorn or Kemmerer Bottle	(lake)
	4	tube composite	(lake)
	5	composite bottle	(lake)
	6	Sangamo collector	(precip)
	7	Aerochemmetric collector	(precip)
	8	MIC collector	(precip)
	9	bulk collector (summer funnel)	(precip)
	10	bulk collector (winter funnel)	(precip)
	11	hand held manual pump	(groundwater)
	13	lysimeter (zero tension)	(groundwater)
	14	auto sampler	(Stream)
SECCHI	Secchi depth in meters- must be present when WLAYER = 5		

6. Submission Check List

- Have you contacted the lab to find out what they require from you?
- Do you have all the bottles for sampling the parameters that are of importance?
- How will you deliver the samples to the lab? During work hours or after hours?
- Will your samples arrive at the lab within the described perishability limits?
- Are any of your samples preserved? Have they been identified (either a note on the bottle or a note on the submission form) as being preserved?
- The only samples to be preserved are Metals (0.25ml conc. Trace metal grade HNO_3 / 80ml sample) and Chlorophyll (0.5 ml, $MgCO_3$ / 500ml sample). This is normally done by the lab. However, this can be done in the field if the sample is taken at a distant source.
- Do you have a Ministry of Environment contact person?
- Do you have an allocated test load approved by the Lab Supervisor? Any exceedances must be approved.
- Have you provided the sample reception clerk your cell phone number or email address so that we may contact you in case there is a problem?
- Remember to report your Field Data if at all possible.
- Make arrangements with the database manager to send you the final results. What file format will the results be in? How quickly do you need your results?
- Is the date submitted correct?
- Is the sample date correct? If the date is not correct, the sample may be discarded if the perishability limit has been exceeded.
- Are all samples listed on the submission form? Count the containers and then count the number listed. Correct any discrepancies. Delete rows that are not used.
- Is the sample time correct and in 24 hour format?
- Does the description on the bottle match the description on the sheet?
- Are your containers leak-free? If a total phosphorous tube leaks, it, and its companion should be repoured in new tubes. Total Phosphorous tubes should be transported upright in the cooler in a rack or wrapped in foam protectors. The protectors are just foam pipe wrap, cut the same length as the tube. Ask the lab if you need any.
- use of freezer packs, rather than ice, is recommended to keep samples cool to avoid sample contamination. If ice has to be used, make sure samples are isolated from melt water.
- **Ask if you’re not sure! The Chem Lab phone number is 705-766-0632.**

7. Parameter perishability limits

Many parameters are not stable over extended periods of time, (even stored at 5 ±4 °C) and the methods for analyzing those parameters specify limits known as Holding Times, (see table below) beyond which samples must be discarded or flagged. Holding Time is defined as the time between the collection of the sample and the start of analysis. It is the *responsibility of the sampler* to ensure that the sample arrives at the lab within an appropriate period of time. For parameters with short perishability limits (5 days) the sample should arrive within 24 and not more than 48 hours after time of sampling. The sampler also needs to take into account weekends (especially long weekends). If shipping by Purolator, consider not shipping on Friday if the samples will sit in their warm warehouse for the weekend. The lab needs to have perishable samples available for a 2-3 day period (not including weekends) during which it can schedule an analytical run. If a sample for pH, alkalinity, or DIC is taken on Wednesday but doesn't reach the lab until Friday, the earliest that it could be analyzed is Monday. The lab will attempt to analyze the samples within the perishable time limit; however, if a run of required method is not scheduled for that day, its perishability limit would be exceeded.
Samples for chemistry products may be analyzed after the holding time and be qualified with the remark UAL (Unreliable: Sample Age Exceeds Normal Limit).
It is also important to consider the chemistry, and where the sample has been taken. In some cases the perishability limits can be exceeded with out much change taking place within the sample. For example, DIC, pH/Alkalinity taken from deep soft water lakes are very sensitive to perishability limits, whereas a surface sample less sensitive. Samples with high conductivity and high pH can sit for more than 5, but less than 10 days with no change. If in doubt, please contact the lab. Leave a note on the submission form indicating samples that can exceed holding time if you are aware of the nature of the water sample.

Products that have Holding Times of 14 days or less

Parameter(s)	Holding Time (*days*)
pH	5
pH – Alkalinity	5
TIC	5
Conductivity	7
Total Phosphorous	10
Ammonia + Nitrate	14
TKN	14
DOC	14
Cations-Ca,Mg,K,Na	14
Chlorophyll	2[1]

[1] Chlorophyll samples that cannot meet the perishability limit should be fixed in the field with 0.5 ml of 1% $MgCO_3$ / 500ml sample

8. Minimum Volumes required for analysis

Note: If volume is not an issue, then all containers are to be filled to the top. Total phosphorus tubes are the only exception.

Bottle Type	Parameter	Minimum sample volume
pH- Alkalinity *Amber narrow mouth HDPE 125 or 250ml*	phalk3042	Must be filled to the top and capped with gas cap.(No air bubble)
TP tube *50 ml glass, boro-silicate with PP cap*	TP3036	Must be filled to above the "etched line", but NO more than 1.0 cm above the "etched line".
PET *Polyethylene terephthalate*	Col3025	30 ml
	Cond3024	30 ml
	Ammno3374	30 ml
	Dorcsi3422	30 ml
	Anion3147	30 ml
	Cat3249	30 ml
	Dtkn3424	60 ml
Chlorophyll *Amber wide mouth HDPE 500 or 1000ml*	DCHL3169	500 ml
Metals *80 ml clear PP specimen jar with blue cap*	Met3386	25 ml
Total Organic Carbon (TOC) and or Total Inorganic Carbon (TIC) *40 ml glass vial with septum*	Carb3028	Must be filled to top with septum in place. No visible air bubble.
New – Multi-Parameter Analyzer PET with septum	pHalk3042 Col3025 Cond3024	Must be filled to top with septum in place. No visible air bubble.

9. Example List of Special Study ID Codes – February 2010

STUDY_ID	STUDY_DESCRIPTION	PERSONNEL
65	Crayfish Survey 2007	Brie Edwards, Keith Somers, Don Jackson
66	Mercury	Greg Mierle, Murray Richardson
67	Martha Celis Flames Lab	Martha Celis, Norm Yan
68	Dallas Flames Chemistry	Dallas, Norn Yan
69	2008 MNR Broad-scale Monitoring	Andrew Paterson
70	A. Cairns' MSC Ca Project	Allegra Cairns, Norm Yan
71	Great Lakes	John Thibeau
72	York University	Natalie Kim/Norm Yan
73	Trent University (Watershed P project)	Andrew Paterson/Huaxia Yao
74	McGill University Special Project	Erin Gertzen/Brian Leung
75	NOBM- Northern Ontario Benthic Monitoring (Sudbury) Sept. 2008	Jocelyne Heneberry/Chantal /Bill Keller
76	Lake of the Woods Tributary	Andrew Paterson/Ron Ingram
77	University of Guelph mobile bulk depositions	Jenny Winter/Bahram
79	Dorset Temporal Streams/Benthos	Chris Jones/Jim Rusak
80	Sudbury Temporal Streams/Benthos	Chris Jones/ Chantal Sarrazin-Delay
81	Far North Sampling - New 2009	Chris Jones/Andrew Paterson

10. List of valid LIMS Program/Study codes

0170701	Dorset Lakes – Dr. Andrew Paterson, Ron Ingram
0170702	Dorset Streams- Dr. Huaxia Yao, Chris Mcconnell
0170703	Dorset Precipitation – Dr. Huaxia Yao, Chris Mcconnell
017070401	Spatial Reference lakes –CAISN Study
017070402	York Flames Lab Studies – Dr. Norm Yan
017070403	Queen's University Studies
017070404	University of Toronto Studies
017070405	OBBN Reference sites – Chris Jones
0170705	Dorset Internal Laboratory testing – Chemistry Lab
0170201	Lake Simcoe (LSEMS) Study – Dr. Jennifer Winter
017020201	Lake Simcoe Tributary Study – Dr. Jennifer Winter
0170204	Lake Simcoe Precipitation Study – Dr. Jennifer Winter
0170601	Trent University Studies
010120701	Lake Partners – Anna DeSellas
010120710	Sudbury/Laurention University - Jocelyne Heneberry

11. List of LIMS Products and Parent Products

Dorset Product code	Common Test Name	Oracle Name	Units
pH3042	pH	PH	pH
pHalk3042	pH Gran Alkalinity Total Alkalinity	PH ALKTI ALKT	pH mg/L mg/L
Col3025	True Colour	COLTR	TCU
Cond3024	Conductivity at 25 °C	COND25	ms/cm^2
Ammno3374	Ammonia(+Ammonium)* Nitrate + Nitrite	NNHTUR NNOTUR	µg/L µg/L
Dorcsi3422	Dissolved Organic Carbon Silicates	DOC SIO3UR	mg/L mg/L
Tp3036	Total Phosphorous	PPUT1, PPUT2	µg/L
Carb3028	Dissolved Inorganic Carbon also known as Total Inorganic Carbon	DIC	mg/L
Anion3147	Chloride Sulphate	CLIDUR SSO4UR	mg/L mg/L
Cat3249	Calcium Magnesium Sodium Potassium	CAUT MGUT NAUT KKUT	mg/L mg/L mg/L mg/L
Dtkn3424	Total Kjeldahl Nitrogen	TKN	µg/L

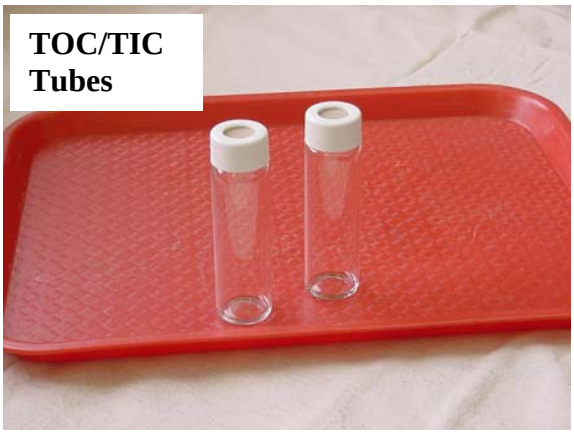
*Ammonia is by far the largest fraction of the two components of NNHTUR in shield lakes

Rexdale Product Code	Common Name	Oracle Name	Units
Dchl3169	Chlorophyll – A Corrected Chlorophyll – A Total	CHLRAC CHLRAT	mg/L mg/L
Met3386	Aluminum Barium Beryllium Calcium Cadmium Cobalt Chromium Copper Iron Magnesium Manganese Molybdenum Nickel Lead Strontium Titanium Vanadium Zinc Hardness	ALUT BAUT BEUT CAUT CDUT COUT CRUT CUUT FEUT MGUT MNUT MOUT NIUT PBUT SRUT TIUT VVUT ZNUT HARDT	µg/L µg/L µg/L mg/L µg/L µg/L µg/L µg/L µg/L mg/L µg/L µg/L µg/L µg/L µg/L µg/L µg/L µg/L mg/L

Parent Products	Matrix	Description	Products Included
DRCCHLO	WS	Dorset Chlorophyll	Dchl3169
DRCLKA	WS	Dorset A Lakes	Phalk3042, Col3025, Cond3024 Ammno3374, Dorcsi3422, Tp3036 Carb3028, Anion3147, Cat3249 Dtkn3424
DRCLKB	WS	Dorset B Lakes	Phalk3042, Ammno3374, Tp3036 Anion3147, Cat3249, Dtkn3424
DRCYORKBYL	WS	York University	Phalk3042, Col3025, Cond3024 Dorcsi3422, Tp3036, Cat3249
DRCPRECIP	WP	Dorset Precipitation	Phalk3042, Cond3024, Ammno3374 Dorcsi3422, Tp3036, Anion3147, Cat3249, Dtkn3424
DRCSIMPR1	WP	Simcoe Precipitation	Phalk3042, Cond3024, Ammno3374 Tp3036, Anion3147, Cat3249 Dtkn3424
DRCSTRMB	WS	Dorset Streams	Phalk3042, Col3025, Cond3024 Ammno3374, Dorcsi3422, Tp3036 Carb3028, Anion3147, Cat3249 Dtkn3424
DRCSEVNS	WS	Severn Sound	Ph3042, Cond3024, Ammno3374 Tp3036, Dtkn3424
SUDLKGEN	WS	Sudbury Lakes General	Phalk3042, Col3025, Cond3024 Dorcsi3422, Carb3028, Anion3147, Cat3249
SUDLKALL	WS	Sudbury Lakes All	Phalk3042, Col3025, Cond3024 Ammno3374, Dorcsi3422, Tp3036 Carb3028, Anion3147, Cat3249 Dtkn3424
SUDLKNUT	WS	Sudbury Lakes Nutrients	Ammno3374, Dtkn3424, Tp3036
DRCKEN	WS	Kenora Lakes	Phalk3042, Col3025, Cond3024 Ammno3374, Dorcsi3422, Tp3036 Anion3147, Cat3249, Dtkn3424
DRCUSGS	WS	Chemistry Lab PT Testing	Ph3042, Cond3024, Ammno3374 Anion3147, Cat3249

12. Collection bottles

PET jars



TOC/TIC Tubes

Total Phosphorus tubes

MPA – PET with Septum

pH-Alkalinity bottles

Chlorophyll bottle

Metal jars

13. Glossary of Terms

Term	Explanation
LIMS	Laboratory Information Management System- Software used by the lab to enter information and results about the sample for archiving
Product	LIMS code for a type of analysis. Can have one or more tests.
Parent Product	A LIMS code for a group of products.

14. Contacts:

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15. Revision History:

15.1 - January 2010 – First draft
15.2 – May 2010 – Final version 1.10
15.3 – February 2011 revised 2010 manual

16. Notes: