

# STARTING A BACTERIOLOGICAL LAB

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Rusk County Health & Human Services

# Why consider your own lab?

- ▣ Cost effective sampling for TNC program
- ▣ Faster results, follow up
- ▣ More careful sample processing
- ▣ Sample at times convenient for your agency
- ▣ Saves staff time
- ▣ Saves mileage
- ▣ Potential revenue from private and municipal systems
- ▣ Cost savings if beach testing
- ▣ It's not as hard as you think!



# The setup

- ▣ Temperature controlled well-lit room
- ▣ Electrical and water sources
- ▣ Lab bench with space to work
- ▣ Separation from other work areas
- ▣ Drawers for storage of supplies
- ▣ Waterproof flooring
- ▣ Access to hand washing and/or dump sink
- ▣ No autoclave necessary

# Equipment Needed

- ▣ Graduated cylinder (B)
- ▣ Incubator
- ▣ Refrigerator
- ▣ Thermometers
- ▣ 365 nm UV light
- ▣ Sealer if beach testing
- ▣ Testing supplies (next slide)

# Other Supplies Needed

- ▣ Sampling forms
- ▣ Tryptic Soy Broth
- ▣ Reagent (Colilert)
- ▣ Sterile Vessels
- ▣ Antimicrobial wipes
- ▣ Bleach with pipets
- ▣ Comparators
- ▣ QC Kits, Distilled Water
- ▣ Quanti-Tray 2000 if beach testing

# Personnel

- ▣ Designation of supervisor- Bachelor's degree and two weeks' or 80 hours of training/ experience in water microbiology at a certified lab.
- ▣ Documentation of training

# The certification

Wisconsin Department of Agriculture, Trade and Consumer Protection  
2811 Agriculture Drive, PO Box 8911, Madison, WI 53708 8911

 **Expires: December 31, 2013**  
**Statute: 93.12**

**Certification Number: 259929-D3**

**Milk, Food and Water Lab Certification**

**Legal Name:**  
**Rusk County Health and Human Services**

**Business Location:** 311 Miner Ave E Suite C220 Ladysmith WI 54848  
**Doing Business As:** Rusk County Public Health Department

**Certificate of Approval**  
Wisconsin Laboratory Number: 105-482

**Lab Type:**  
Certified for SDWA, Enzymatic Substrate

**Water Test:**  
Coliform or Coliform-18 (Drinking Water)

- Licensed (fee exempt) through DATCP Division of Food Safety
- Contact: Laura Traas, Lab Evaluation Officer
- Laura.Traas@wisconsin.gov
- Resource during setup, and onsite evaluation before sample processing

This is your computerized certification/regulation document. Post or carry as required by law. Non-transferable - subject to revocation or suspension as provided by law. Print this card and carry as identification.

DMS-511 (06/2013)161

REC-10 (rev. 06/08)

**RUSK COUNTY HEALTH AND HUMAN SERVICES**  
311 MINER AVE E SUITE C220  
LADYSMITH WI 54848

DATCP Contact : (608) 224-4736





# SOP: Sampling Procedures

- ▣ Field sampling procedures
- ▣ When to reject samples (frozen, old, no paperwork, filled too full)

# SOP: Processing Samples

- ▣ Clean work area and wash hands
- ▣ Verify that sample can be processed
- ▣ Label sample and paperwork
- ▣ Remove cap and pour out to 100 mL exactly
- ▣ Pour in one blister pack of reagent
- ▣ Mix by inversion
- ▣ Place in incubator for 24 hours

# SOP: Interpreting Sample Results

- ▣ Sample is colorless after 24 hours
  - Safe, coliform negative
- ▣ Sample is yellow any time up to 28 hours
  - Unsafe, coliform positive (test for E. coli)
- ▣ Sample is yellow and fluoresces
  - Unsafe, E. coli positive
- ▣ Sample is questionable between clear and yellow
  - Place back into incubator for up to 4 hours
- ▣ Sample turns red, green, black, or has other unusual response:
  - Invalidate and request another sample
  - Potential interference



# Disposal of Waste

- ▣ 50-150 ppm bleach in positive bottles
- ▣ Shake then dump down drain
- ▣ Bottles are household garbage
- ▣ Quanti-trays placed in a pan filled with bleach water and each cell pricked

# Sample Reporting

- ▣ Call operators, some municipalities like to know right away
- ▣ Complete Paperwork and file
- ▣ Report Electronically to DNR if applicable

# Record Keeping

- ▣ MSDS Sheets kept for 15 years past when last used
- ▣ Owner's manuals and receipts for equipment and products
- ▣ Proficiency Testing Records
- ▣ Temperature Logs
- ▣ DATCP Audits
- ▣ Internal QC records document
- ▣ Sample results

# Quality Control: Sample Containers

- ▣ Volume evaluated with graduated cylinder  $\pm 2$
- ▣ Sterility confirmed with TSB
  - ▣ TSB pH tested, good for 90 days
- ▣ Fluorescence checked
- ▣ Sodium Thiosulfate checked
- ▣ Physical inspection

# Quality Control: Colilert

- ▣ QC kit with *E. coli*, *Klebsiella pneumonia* (coliform), and *Pseudomonas aeruginosa* (non coliform)
- ▣ Checked for fluorescence
- ▣ Reference comparator kept
- ▣ Storage: 2-30 °C away from light
- ▣ Package checked for lot number and expiration date; labeled with QC date and opened date before being put away.
- ▣ Date of last use of lot number documented

# Quality Control: Holding Devices

- ▣ Incubator
  - $35^{\circ}\text{C} \pm .5^{\circ}\text{C}$
  - NIST Traceable thermometers on all shelves
    - ▣ Calibrate or replace annually
  - Record time, temp, initials 2x per day
- ▣ Refrigerator
  - 1-5 °C (2-8 °C for Quanti-Cult)
  - NIST traceable thermometers
    - ▣ Calibrate or replace annually
  - Record time, temp, initials once per day

# Quality Control Frequency

- ▣ Every lot or every 90 days for reagent (whichever is less)
- ▣ Every lot for sample bottles
- ▣ Every 90 days TSB
- ▣ Annually for thermometers

# WSLH Proficiency Testing



# WSLH Proficiency Testing

- ▣ March and October shipments of 5 unknown bottles
- ▣ Analyze as usual
- ▣ Fill out report and send back
- ▣ Alternate analysts
- ▣ \$288

# Startup Costs

## RECURRING (SUPPLIES)

- ▣ Sample Bottles \$110/200
- ▣ Colilert \$93/20
- ▣ Quanti-Cult \$140/3
- ▣ TSB \$61/ 1 year
- ▣ Wipes \$6/ea
- ▣ Thermometers \$64
- ▣ Comparator \$7/ea
- ▣ WSLH PT: \$288

## EQUIPMENT

- ▣ Incubator \$500-2000
- ▣ Floor Mats \$190
- ▣ UV Light \$120
- ▣ Grad Cylinder \$26
- ▣ (Sealer \$4000)
- ▣ **Total \$1950**

# Rusk County's Operating Costs

- ▣ 70 TNC (reimbursement: \$9100)
- ▣ 4 Municipalities (revenue: \$1450 @ \$15 ea)
- ▣ 250-300 Bac-t tests per year
- ▣ Reagent \$1400
- ▣ TSB \$61 + \$40 pH
- ▣ Bottles \$150
- ▣ Wipes \$30
- ▣ Thermometers \$64
- ▣ Comparator \$7
- ▣ WSLH PT \$288
- ▣ **Total \$2050**

Nitrates and Nitrites are still shipped out at a cost of \$18.50 ea \* 70 + shipping.  
**Total: \$1350**

# Year One Costs vs. Reimbursement

- ▣ Bacteria Lab Costs: \$2050
  - ▣ Nitrate Sampling Costs: \$1350
  - ▣ Equipment Costs: \$1950
  - ▣ (Staff time and traveling for TNC)
  - ▣ Total: \$5350
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- ▣ TNC Revenue: \$9100
  - ▣ Other Revenue: \$1450
  - ▣ (Cost savings for beach testing, convenience)
  - ▣ Total: \$10550

# Price per Test

## INTERNAL LAB

- ▣ Bottle \$0.57
- ▣ Reagent \$4.92
- ▣ Bottle QA \$0.17
- ▣ Reagent QA \$1.21
- ▣ Analyst time \$5.00
- ▣ Administrative \$0.83
- ▣ **TOTAL \$12.70**

## EXTERNAL LAB

- ▣ Cost per test \$18.50-\$25
- ▣ Shipping
- ▣ Extra time and mileage by staff

# Resources

- ▣ EPA Manual for the Certification of Laboratories Analyzing Drinking Water
- ▣ Water and Wastewater Standard Methods
- ▣ Lab Evaluator
- ▣ Rusk County would be happy to send you a copy of our SOP's or spreadsheets proving cost efficiency of a lab if you email me at [ccooper@ruskcountywi.us](mailto:ccooper@ruskcountywi.us)

QUESTIONS?