Equipment

- Field list provided (p.11 manual)
- Suppliers list (provided in folder)

Lessons Learned

Planning

- Remember that supplies take up a lot of space initially; Plan for necessary storage space (in fridge and freezer too)!
- 3M Petrifilm spreaders can take a few weeks to arrive if buying in bulk

Lessons Learned

Orientation and Project Commitment

- Get a firm commitment from interested volunteers and set training dates early in season
- Require attendance at entire training

Lessons Learned

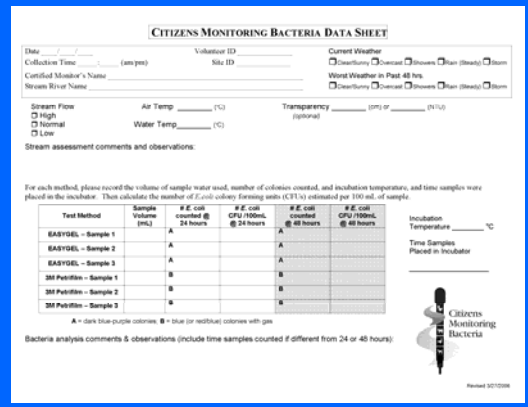
Equipment and Inventory

- Provide all supplies volunteers will need in an organized “kit”
- Don’t give out too many supplies initially; Wait to see commitment level of each volunteer
- Plan for an initial inventory and a mid-summer re-supply

Lessons Learned

Communication and Feedback

- Stress the need for timely data submission
- Stress the importance of filling out data sheets completely
- Check data sheets as they arrive
- Visit volunteers at least once during the season
- Report back to volunteers 2-3 times during the summer



CITIZENS MONITORING BACTERIA DATA SHEET

Date ___/___/___ Volunteer ID _____ Current Weather ❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Collection Time ___:___ (am/pm) Site ID _____

Certified Monitor's Name _____ Worst Weather in Past 48 hrs. ❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Stream/River Name _____

Stream Flow ❒ High ❒ Normal ❒ Low

Air Temp _____ (°C) Water Temp _____ (°C)

Transparency _____ (cm) or _____ (NTU) (optional)

Stream assessment comments and observations:

For each method, please record the volume of sample water used, number of colonies counted, and incubation temperature, and time samples were placed in the incubator. Then calculate the number of *E.coli* colony forming units (CFUs) estimated per 100 mL of sample.

Test Method	Sample Volume (mL)	# *E. coli* counted @ 24 hours	# *E. coli* CFU /100mL @ 24 hours	# *E. coli* counted @ 48 hours	# *E. coli* CFU /100mL @ 48 hours
EASYGEL – Sample 1		A		A	
EASYGEL – Sample 2		A		A	
EASYGEL – Sample 3		A		A	
3M Petrifilm – Sample 1		B		B	
3M Petrifilm – Sample 2		B		B	
3M Petrifilm – Sample 3		B		B	

Incubation Temperature _____ °C

Time Samples Placed in Incubator _____

A = dark blue-purple colonies; B = blue (or red/blue) colonies with gas

Bacteria analysis comments & observations (include time samples counted if different from 24 or 48 hours):

Citizens Monitoring Bacteria

Revised 3/27/2006

Applying knowledge to improve water quality

Great Lakes Regional Water Program

A Partnership of USDA CSREES & Land Grant Colleges and Universities

Lessons Learned

Making it Easy for the Volunteers

- Provide postage paid envelopes for returning data sheets
- Provide extra copies of data sheets
- Laminate field and lab methods
- Minimize number of ID #s, codes, you ask volunteers to use

Site Selection

- Choose sites based on project goals
- Consider
  - Tributaries or other inflows to the stream
  - Land uses alongside the stream
- Also consider:
  - Budget
  - Number of volunteers
  - Safety
  - Access
    - Get written permission if monitoring on private land. Know state laws.

Applying knowledge to improve water quality
Great Lakes Regional Water Program
A Partnership of USDA CSREES & Land Grant Colleges and Universities

Site Selection Resources

- EPA's Volunteer Stream Monitoring Methods Manual http://www.epa.gov/volunteer/stream/stream.pdf
- Washington Dept. of Ecology's, "A Citizen's Guide to Understanding and Monitoring Streams and Lakes" http://www.ecy.wa.gov/Programs/wq/plants/management/joysmanual/selectingstreamlocations.html

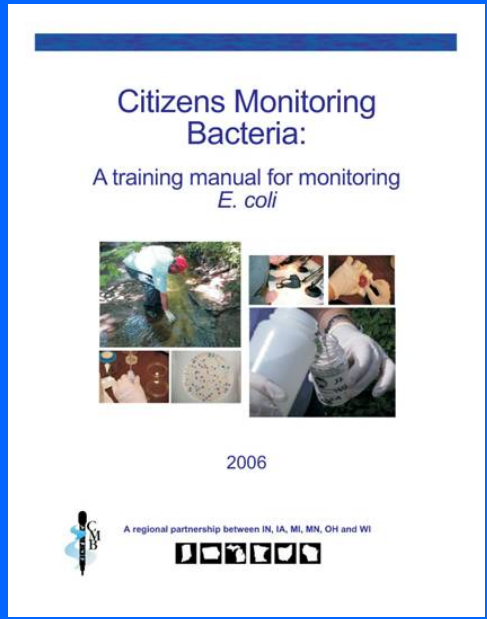
Frequency of Monitoring

- Choose frequency based on project goals
  - Check your state or local recommendations
  - Monthly for screening
  - Five times within 30 days to dete[illegible] geometric mean
- Be consistent in time of day
- Have regular intervals between sampling dates

Applying knowledge to improve water quality
Great Lakes Regional Water Program
A Partnership of USDA CSREES & Land Grant Colleges and Universities

Quality Assurance

- Maintain quality in practices and procedures
  - Defining and documenting methodologies
  - Training volunteers
  - Keeping accurate records
  - Following chain of custody procedures
  - Checking expiration dates



Applying knowledge to improve water quality
Great Lakes Regional Water Program
A Partnership of USDA CSREES & Land Grant Colleges and Universities

Quality Assurance

Expiration dates on bottle and box that media comes in

Expiration date on bag
Petri dishes come in
store at room temp
and keep bag sealed
once opened

Quality Control

- Ensure samples are collected consistently and accurately
  - Field blanks
  - Field and lab replicates
  - Control plates
  - Split samples
  - Regular inspection of equipment

Resource about QA/QC

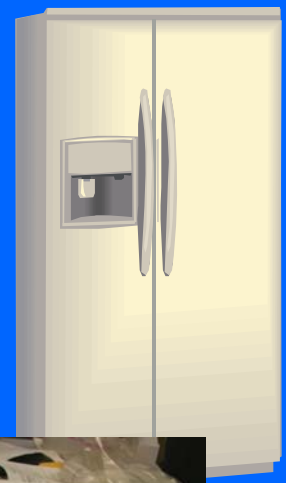
- **Building Credibility: Quality Assurance and Quality Control for Volunteer Monitoring Programs**

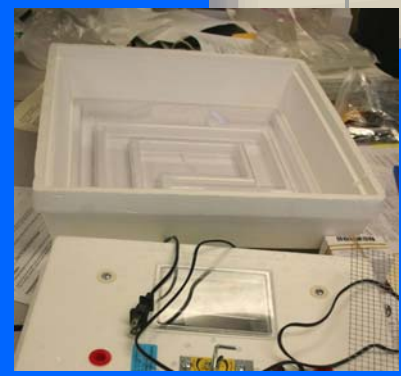
  http://www.usawaterquality.org/volunteer/Outreach/BuildingCredibilityVI.pdf

Field sampling and preparing the test plates

Field Sampling – Before you go

- Take Petrifilm out of fridge to warm to room temperature
- Take Easygel out of freezer to thaw
- Fill trays in incubator with distilled water
- Turn on incubator to 35^{o}C
- Collect supplies, including an ice pack

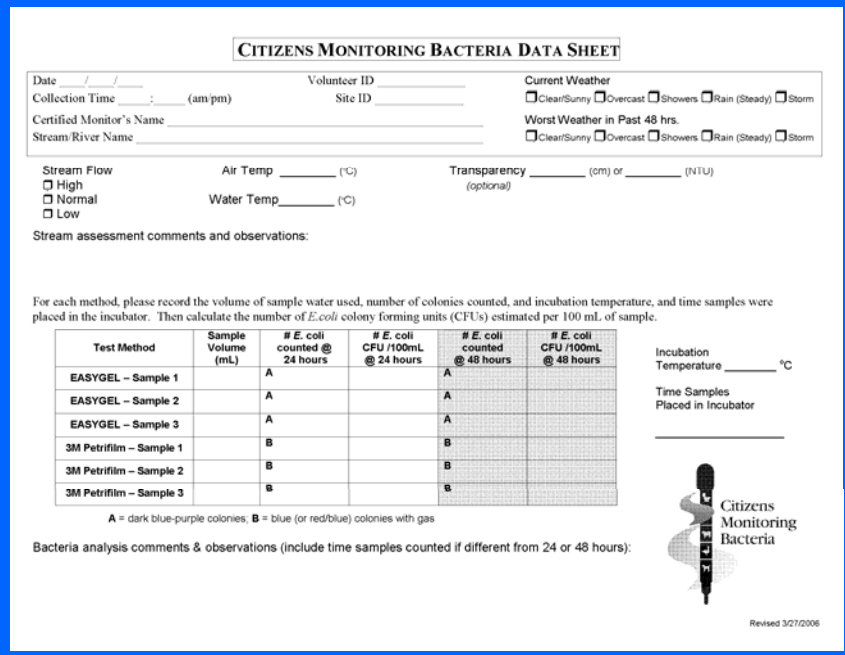




Applying knowledge to improve water quality
Great Lakes Regional Water Program
A Partnership of USDA CSREES & Land Grant Colleges and Universities

Field Sampling at the Site

- Hang thermometer for air temp
- Complete top section of data sheet
- Take water temp, record on data sheet
- Put on gloves
- Label sample bottles
- Take transparency tube reading (optional)



CITIZENS MONITORING BACTERIA DATA SHEET

Date ___/___/___ Volunteer ID _____ Current Weather

Collection Time ____:____ (am/pm) Site ID _____ ❒Clear/Sunny ❒Overcast ❒Showers ❒Rain (Steady) ❒Storm

Certified Monitor's Name _____ Worst Weather in Past 48 hrs.

Stream/River Name _____ ❒Clear/Sunny ❒Overcast ❒Showers ❒Rain (Steady) ❒Storm

Stream Flow
❒ High
❒ Normal
❒ Low

Air Temp _____ (°C)

Water Temp_____ (°C)

Transparency _____ (cm) or _____ (NTU)
(optional)

Stream assessment comments and observations:

For each method, please record the volume of sample water used, number of colonies counted, and incubation temperature, and time samples were placed in the incubator. Then calculate the number of *E.coli* colony forming units (CFUs) estimated per 100 mL of sample.

Test Method	Sample Volume (mL)	# *E. coli* counted @ 24 hours	# *E. coli* CFU /100mL @ 24 hours	# *E. coli* counted @ 48 hours	# *E. coli* CFU /100mL @ 48 hours
EASYGEL – Sample 1		A		A	
EASYGEL – Sample 2		A		A	
EASYGEL – Sample 3		A		A	
3M Petrifilm – Sample 1		B		B	
3M Petrifilm – Sample 2		B		B	
3M Petrifilm – Sample 3		B		B	

A = dark blue-purple colonies; **B** = blue (or red/blue) colonies with gas

Incubation Temperature _____ °C

Time Samples Placed in Incubator

_____

Citizens Monitoring Bacteria

Bacteria analysis comments & observations (include time samples counted if different from 24 or 48 hours):

Revised 3/27/2006

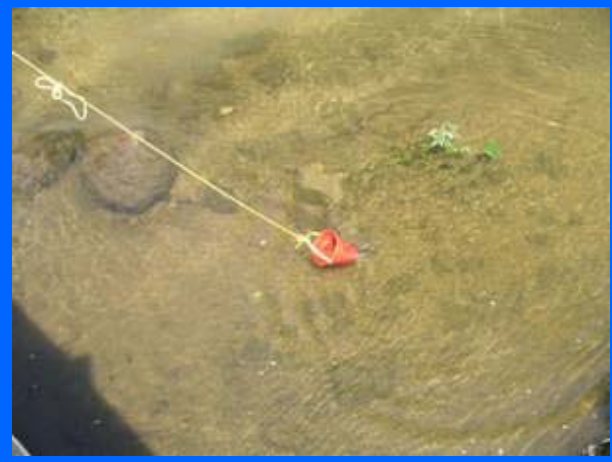
Applying knowledge to improve water quality
Great Lakes Regional Water Program
A Partnership of USDA CSREES & Land Grant Colleges and Universities

Collecting a Sample in the Stream

- Rinse collection bottle 3 times
  - Cover and shake well when rinsing
- Dip the bottle into the water upside down and pointing upstream
  - Keep your hands away from lip & lid
- Tip it up and allow to fill completely; cap it
- If splitting sample, shake bottle well before pouring

Sampling from a bridge

- Use a sterile bucket if possible
- If not possible, the following steps will help prevent cross-contamination:
  - Drop bucket into the stream and allow to fill, pull it up
  - Shake it well to rinse; rinse 3 tim
  - Fill again, and use it to rinse the collection bottle 3 times
  - THEN fill the bucket again, and from that fill the collection bottle



Accuracy and variability

Results may not be accurate when:

- Samples aren’t kept cold
- Samples don’t reach lab within 24 hours
- Samples aren’t from a single split
- Work space or equipment isn’t sterile
- Bottles, lids, pipettes are contaminated

Time for Some Hands-On Work

Applying knowledge to improve water quality
Great Lakes Regional Water Program
A Partnership of USDA CSREES & Land Grant Colleges and Universities

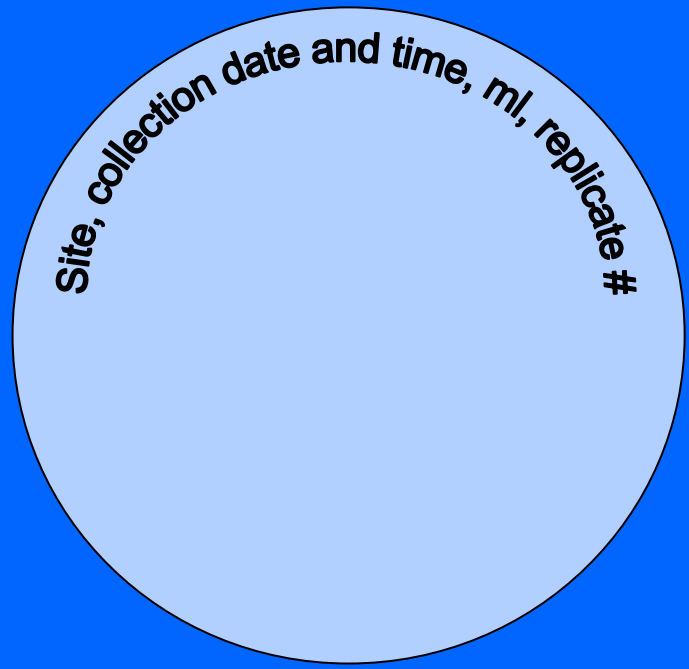
Preparing to plate samples

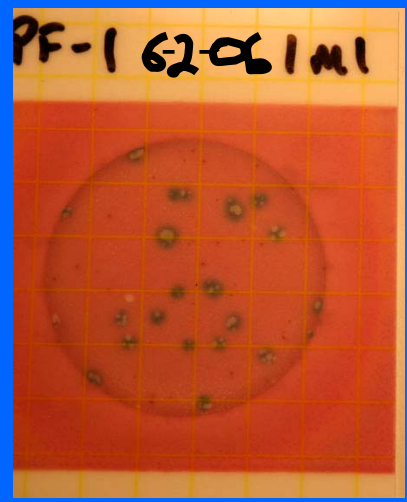
- Disinfect work space and collect supplies
- Check incubator temp, adjust to 35^{o}C
- Make sure Easygel media and Petrifilm plates are at room temperature

Preparation continued

- Label the bottom Petri dishes along the edge, and at the front top of Petrifilm using a permanent marker
  - Label should include:
    - site name
    - date and time of collection
    - volume of water plated (ml)
    - replicate #, if any

- Why label the bottom of dish?





Coliscan Easygel Plating

- Carefully remove pipette from sterile paper (keep sterile)

- Transfer 1 ml to 5 ml of water from collection container (after mixing) to Easygel media bottle
  - Label your media bottle with # of mls used & mix bottle

- Pour media into labeled petri dish

- Swirl the dish (figure-8 mode) gently to evenly distribute the media (be careful not to splash over the side or get any on the lid)

- Let plates sit undisturbed at room temperature (out of direct sunlight) for 45 minutes or until solid

STOP HERE UNTIL MEDIA IS SOLID

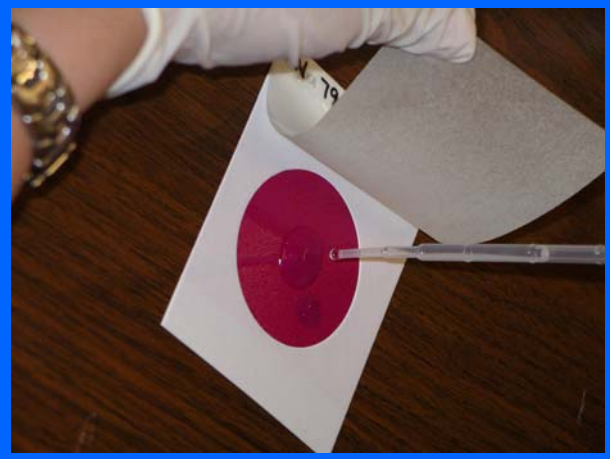
- After media gels, add to incubator, upside down (to reduce condensation on plate bottom). They can be stacked on top of one another

CMB

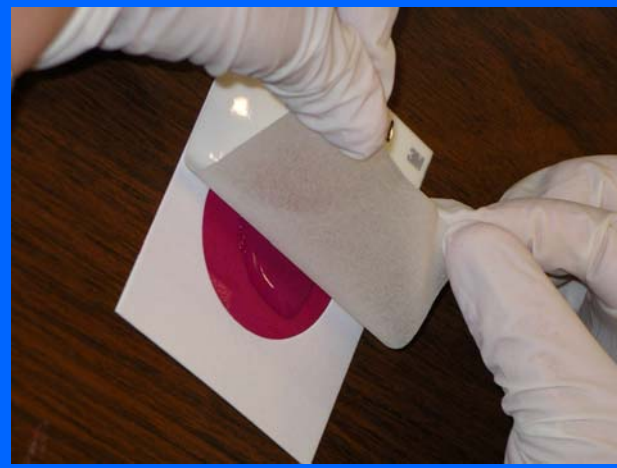
Applying knowledge to improve water quality
Great Lakes Regional Water Program
A Partnership of USDA CSREES & Land Grant Colleges and Universities

Plating 3M™ Petrifilm™

1. Pipette water sample (1 ml only)



2. Lift film and dispense sample onto pink



3. Carefully roll down film

4. Gently use spreader, if needed

5. Let sit 1 minute

6. Put in incubator right side up (can be stacked)

- 24 hours later….

Reading & Interpreting Easygel Plates

- Count after 24 hours of incubation
- Optional: Count again after 48 hours
- Count dark blue or deep purple colonies
- Teal and pink colonies are not *E. coli*

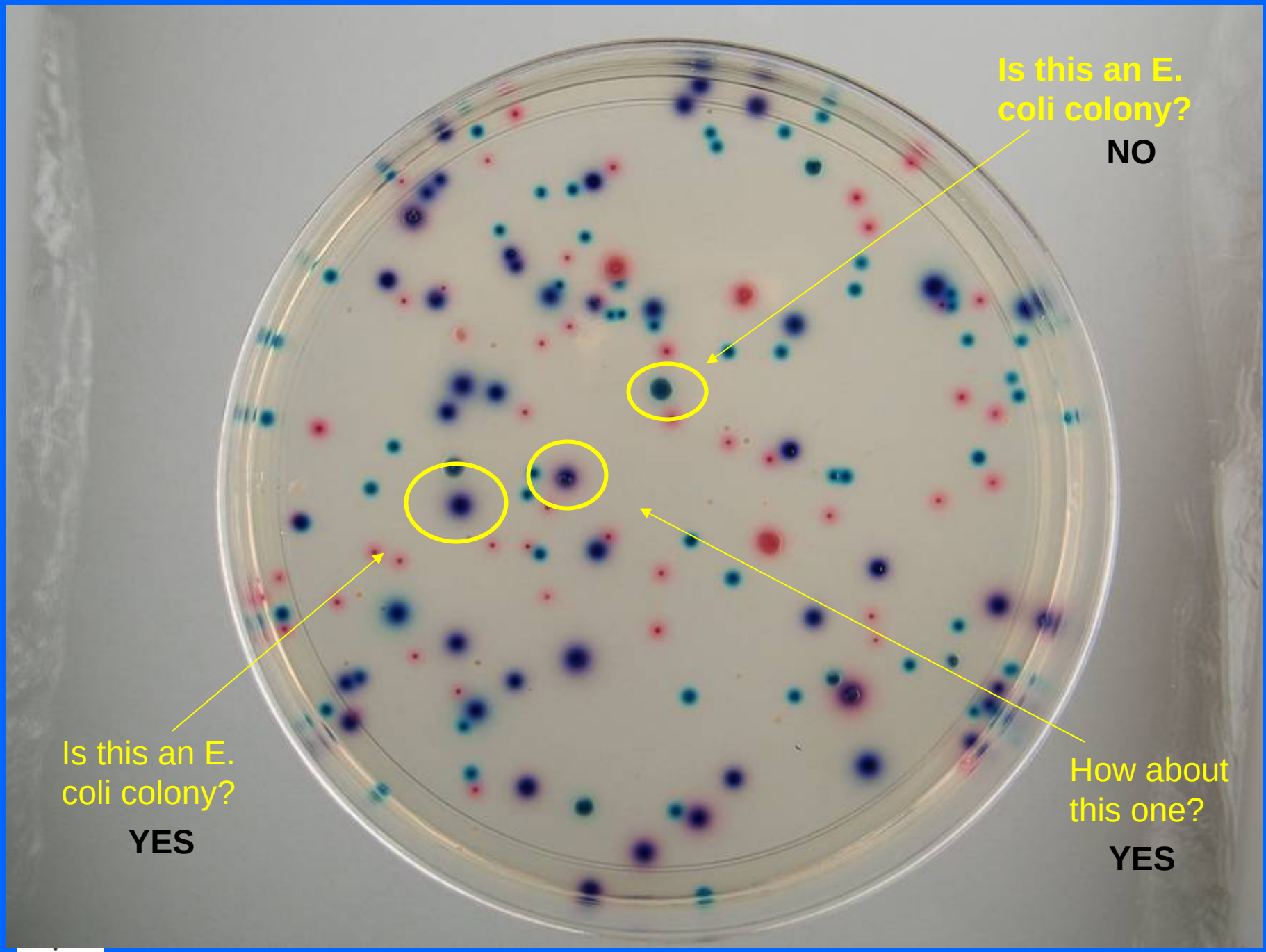
Applying knowledge to improve water quality
Great Lakes Regional Water Program
A Partnership of USDA CSREES & Land Grant Colleges and Universities

Coliscan Easygel

Contains 2 enzymes specific chemicals (chromogens)

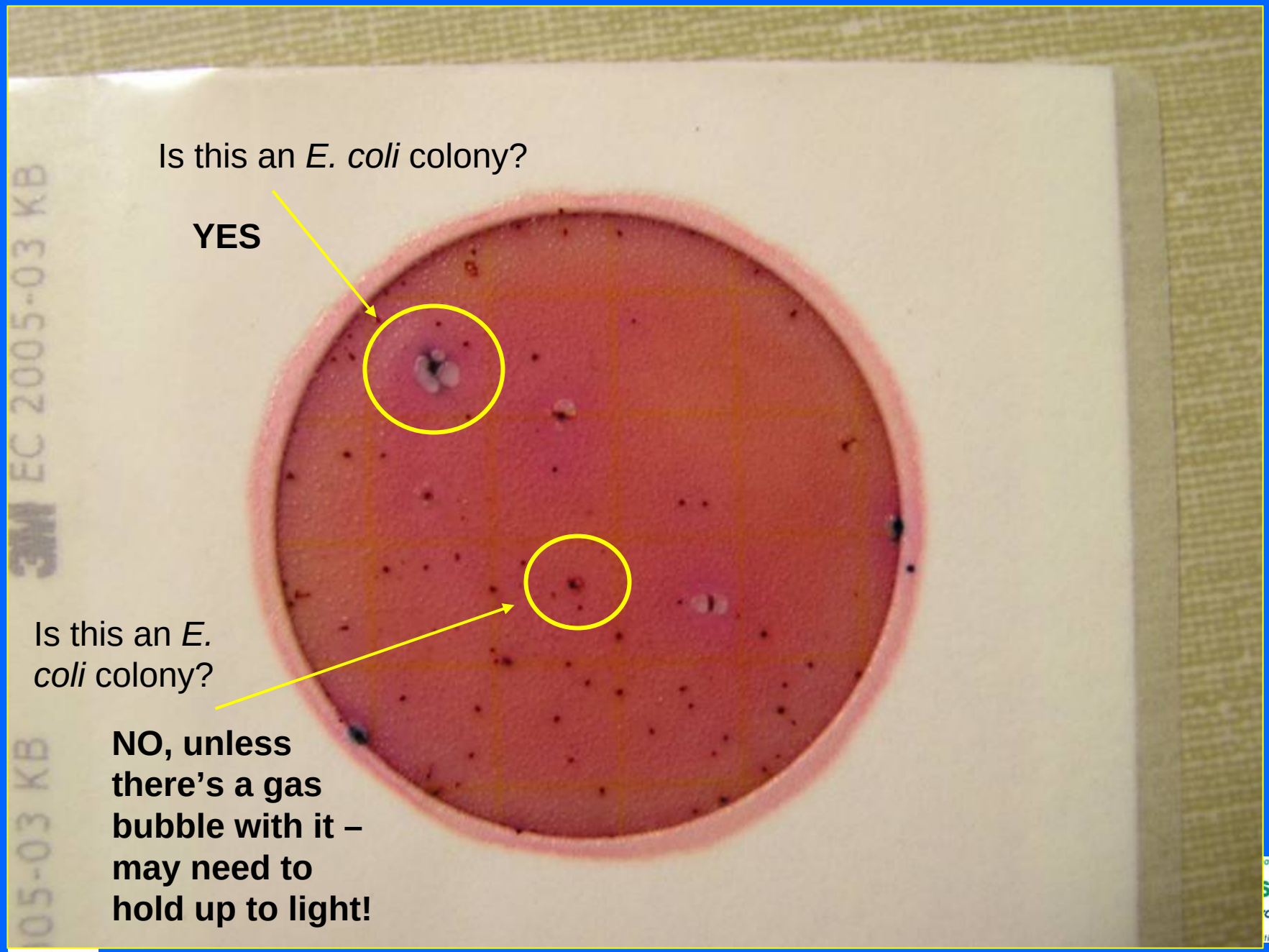
- "Red Gal" (galactosidase)
  - Red or pink color produced
- "X-Gluc" (glucuronidase)
  - Teal color produced
- Only *E. coli* produces both enzymes

Red + Teal = Dark Blue/Purple


Is this an E. coli colony?
NO
Is this an E. coli colony?
YES
How about this one?
YES

Reading & Interpreting Petrifilm Plates

- Count after 24 hours incubation
- Count blue colonies WITH gas bubbles
- Don’t count blue colonies without gas bubbles
- Don’t count pink or white colonies with or without gas bubbles

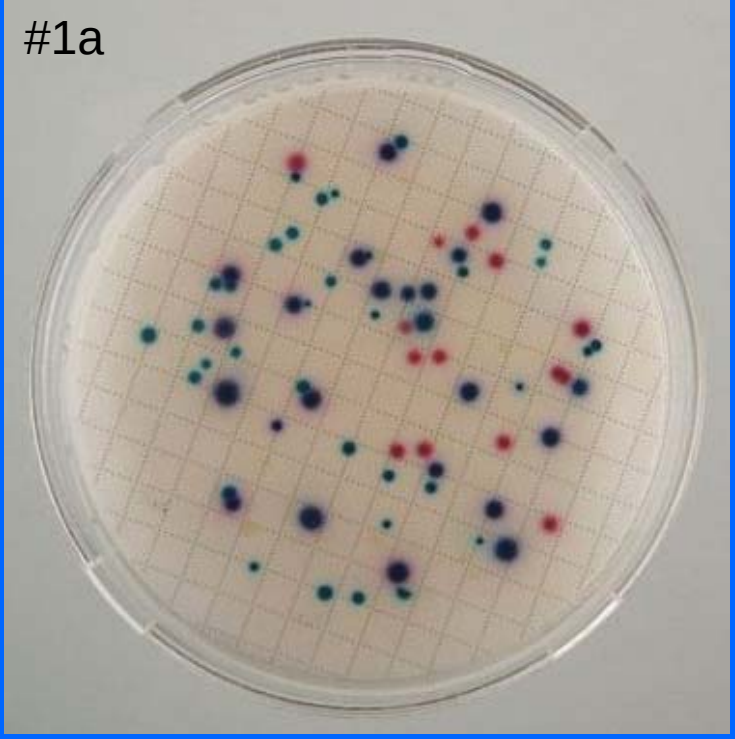

Is this an *E. coli* colony?
YES
Is this an *E. coli* colony?
NO, unless there's a gas bubble with it – may need to hold up to light!
3M EC 2005-03 KB

Disposing of plates

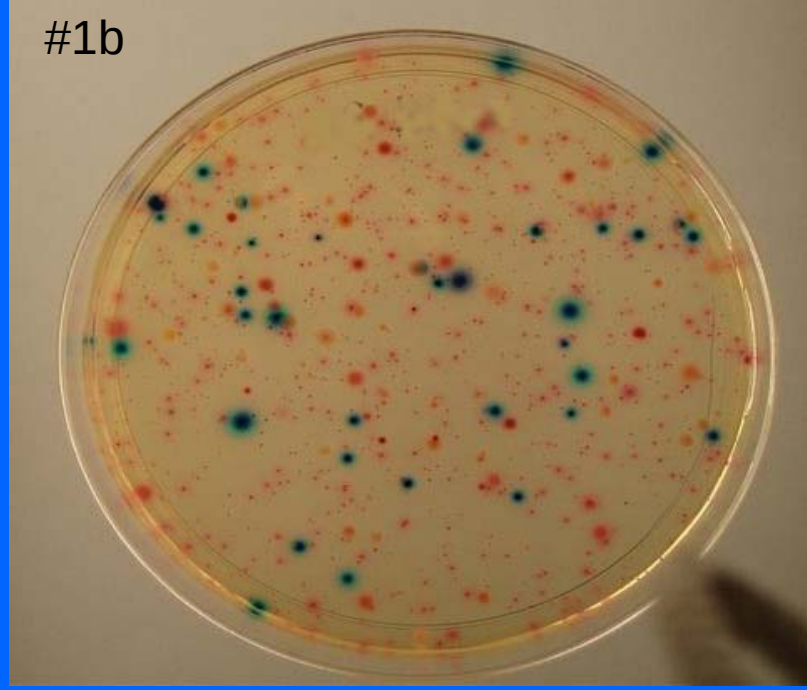
- Add a teaspoon of bleach to each Easygel Petri dish
- Cover and place in a ziplock bag
- Put Petrifilms in the same ziplock bag
- Zip tightly and throw in trash
- Dump remaining water sample and throw sample bottle in trash

Observations and colony counting

#1a

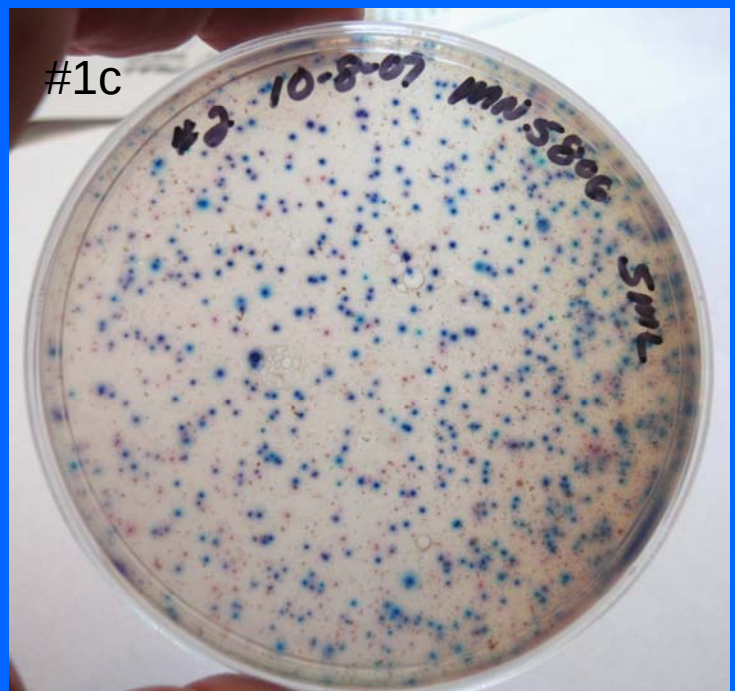


#1b

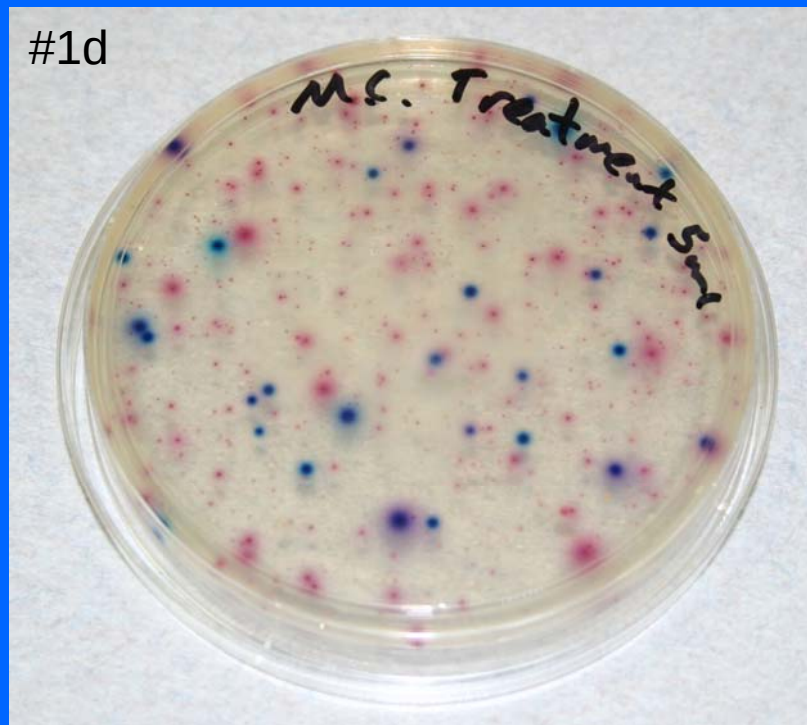


Coliscan Easygel7 Plate Samples

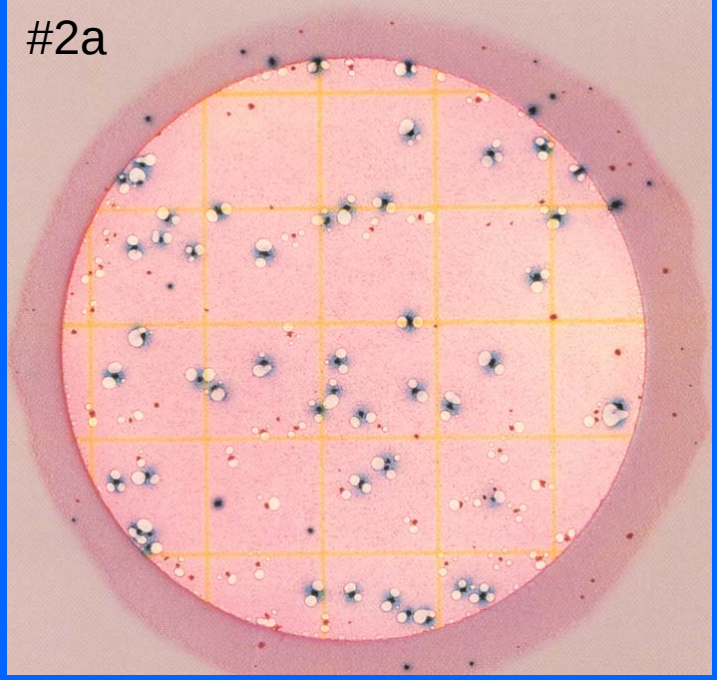
#1c



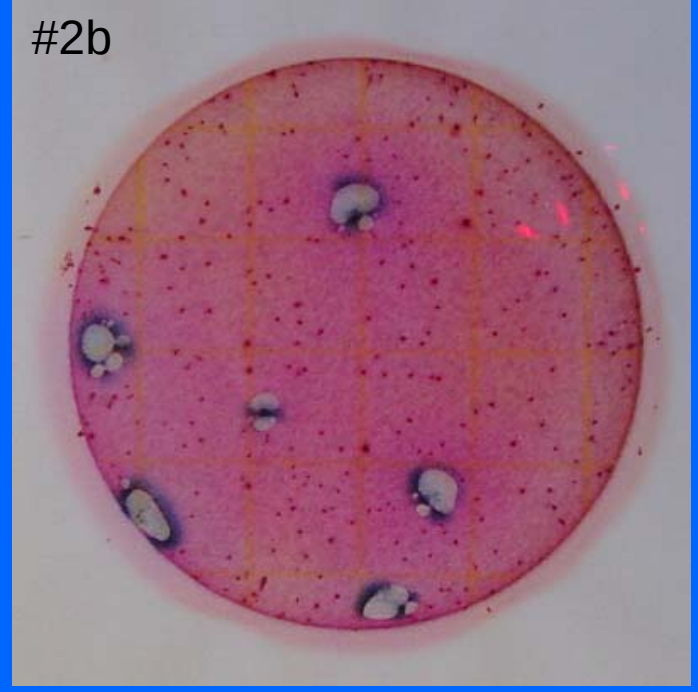
#1d



#2a

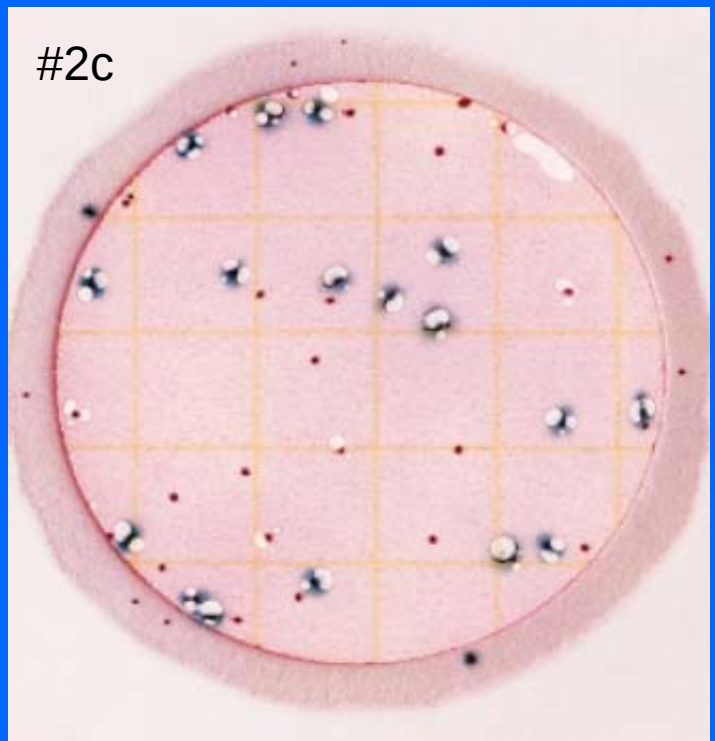


#2b

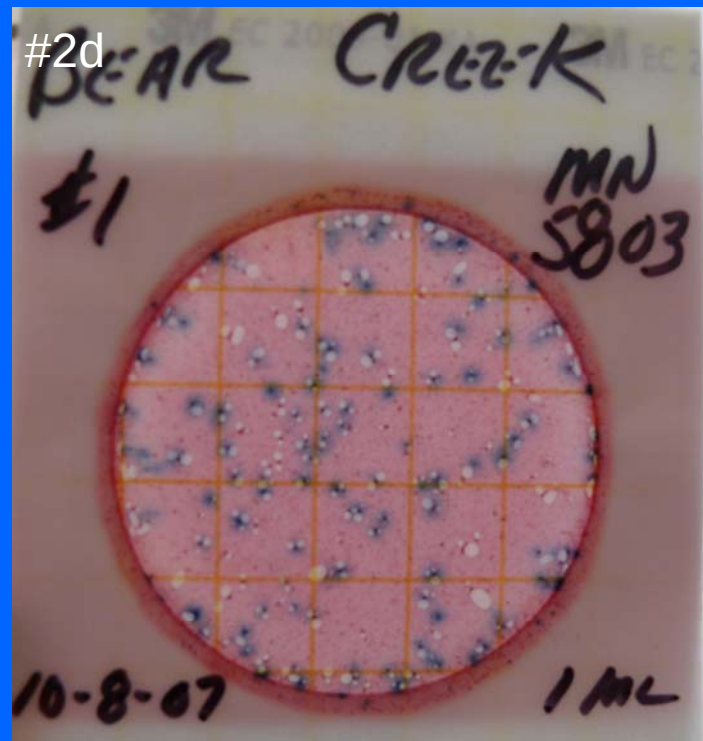


3M Petrifilm™
Sample Plates

#2c



#2d



CITIZENS MONITORING BACTERIA DATA SHEET

Date ____/____/____ Volunteer ID _____

Collection Time _____:_____ (am/pm) Site ID _____

Certified Monitor's Name _____

Stream/River Name _____

Current Weather

❒Clear/Sunny ❒Overcast ❒Showers ❒Rain (Steady) ❒Storm

Worst Weather in Past 48 hrs.

❒Clear/Sunny ❒Overcast ❒Showers ❒Rain (Steady) ❒Storm

Stream Flow Air Temp (°C) Transparency (cm) or (NTU)

❒ High
❒ Normal
❒ Low

Stream asse

- Convince volunteers to fill out data sheet completely
- Having both site ID and description provides verification
- Collection time confirms sample reached lab within 24 hrs
- Weather, flow, and transparency provide context
- Additional comments boost understanding of conditions
- Time put in incubator makes sure of proper timing
- Calculations …

For each met were placed in the

°C

or

T					
EASY					
EASY					
EASY					
3M Pet					
3M Petrifilm – Sample 2					
3M Petrifilm – Sample 3		B		B	

A = dark blue-purple colonies; **B** = blue (or red/blue) colonies with gas

Bacteria analysis comments & observations (include time samples counted if different from 24 or 48 hours):

Citizens Monitoring Bacteria

Revised 3/27/2006

Counting Easygel plates

- Use the laminated pages
- Count 1d
- 2 mls of sample
- Fill in the data sheet

CITIZENS MONITORING BACTERIA DATA SHEET

Date ____/____/____ Volunteer ID _____

Collection Time _____:_____ (am/pm) Site ID _____

Certified Monitor's Name _____

Stream/River Name _____

Current Weather

❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Worst Weather in Past 48 hrs.

❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Stream Flow

❒ High

❒ Normal

❒ Low

Air Temp _____ (°C)

Water Temp_____ (°C)

Transparency _____ (cm) or _____ (NTU)

(optional)

Stream assessment comments and observations:

For each method, please record the volume of sample water used, number of colonies counted, and incubation temperature, and time samples were placed in the incubator. Then calculate the number of *E.coli* colony forming units (CFUs) estimated per 100 mL of sample.

Test Method	Sample Volume (mL)	# *E.* coli counted @ 24 hours	# *E.* coli CFU /100mL @ 24 hours	# *E.* coli counted @ 48 hours	# *E.* coli CFU /100mL @ 48 hours
EASYGEL – Sample 1		**A**		**A**	
EASYGEL – Sample 2		**A**		**A**	
EASYGEL – Sample 3		**A**		**A**	
3M Petrifilm – Sample 1		**B**		**B**	
3M Petrifilm – Sample 2		**B**		**B**	
3M Petrifilm – Sample 3		**B**		**B**	

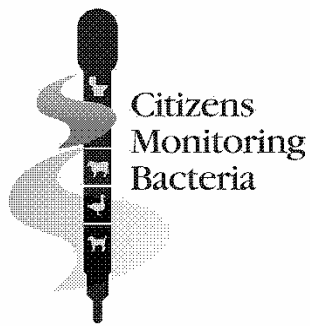
A = dark blue-purple colonies; **B** = blue (or red/blue) colonies with gas

Incubation Temperature _____ °C

Time Samples Placed in Incubator

_____

Bacteria analysis comments & observations (include time samples counted if different from 24 or 48 hours):



Revised 3/27/2006

CITIZENS MONITORING BACTERIA DATA SHEET

Date ____/____/____ Volunteer ID _____

Collection Time _____:_____ (am/pm) Site ID _____

Certified Monitor's Name _____

Stream/River Name _____

Current Weather

❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Worst Weather in Past 48 hrs.

❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Stream Flow

❒ High

❒ Normal

❒ Low

Air Temp _____ (°C)

Water Temp_____ (°C)

Transparency _____ (cm) or _____ (NTU)

(optional)

Stream assessment comments and observations:

For each method, please record the volume of sample water used, number of colonies counted, and incubation temperature, and time samples were placed in the incubator. Then calculate the number of *E.coli* colony forming units (CFUs) estimated per 100 mL of sample.

Test Method	Sample Volume (mL)	# *E.* coli counted @ 24 hours	# *E.* coli CFU /100mL @ 24 hours	# *E.* coli counted @ 48 hours	# *E.* coli CFU /100mL @ 48 hours
EASYGEL – Sample 1		**A**		**A**	
EASYGEL – Sample 2		**A**		**A**	
EASYGEL – Sample 3		**A**		**A**	
3M Petrifilm – Sample 1		**B**		**B**	
3M Petrifilm – Sample 2		**B**		**B**	
3M Petrifilm – Sample 3		**B**		**B**	

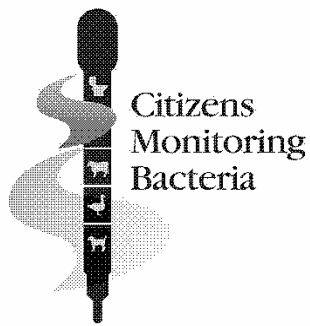
A = dark blue-purple colonies; **B** = blue (or red/blue) colonies with gas

Incubation Temperature _____ °C

Time Samples Placed in Incubator

_____

Bacteria analysis comments & observations (include time samples counted if different from 24 or 48 hours):



Revised 3/27/2006

CITIZENS MONITORING BACTERIA DATA SHEET

Date ____/____/____ Volunteer ID _____

Collection Time _____:_____ (am/pm) Site ID _____

Certified Monitor's Name _____

Stream/River Name _____

Current Weather

❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Worst Weather in Past 48 hrs.

❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Stream Flow

❒ High

❒ Normal

❒ Low

Air Temp _____ (°C)

Water Temp_____ (°C)

Transparency _____ (cm) or _____ (NTU)

(optional)

Stream assessment comments and observations:

For each method, please record the volume of sample water used, number of colonies counted, and incubation temperature, and time samples were placed in the incubator. Then calculate the number of *E.coli* colony forming units (CFUs) estimated per 100 mL of sample.

Test Method	Sample Volume	# *E.* coli counted @	# *E.* coli CFU /100mL	# *E.* coli counted @ 48 hours	# *E.* coli CFU /100mL @ 48 hours
EASYGEL – Sample 1				A	
EASYGEL – Sample 2		A		A	
EASYGEL – Sample 3		A		A	
3M Petrifilm – Sample 1		B		B	
3M Petrifilm – Sample 2		B		B	
3M Pet					

2

5

250

Incubation Temperature _____ °C

Time Samples Placed in Incubator

_____

Bacteria ana

100 mls / 2 mls sample = 50

50 x 5 = 250 cfu/100 mls sample

Citizens Monitoring Bacteria

Revised 3/27/2006

Counting Petrifilm plates

- Use the laminated pages
- Count 2c
- 1 ml of sample
- Fill in the data sheet

CITIZENS MONITORING BACTERIA DATA SHEET

Date ____/____/____ Volunteer ID _____

Collection Time _____:_____ (am/pm) Site ID _____

Certified Monitor's Name _____

Stream/River Name _____

Current Weather

❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Worst Weather in Past 48 hrs.

❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Stream Flow

❒ High

❒ Normal

❒ Low

Air Temp _____ (°C)

Water Temp_____ (°C)

Transparency _____ (cm) or _____ (NTU)

(optional)

Stream assessment comments and observations:

For each method, please record the volume of sample water used, number of colonies counted, and incubation temperature, and time samples were placed in the incubator. Then calculate the number of *E.coli* colony forming units (CFUs) estimated per 100 mL of sample.

Test Method	Sample Volume (mL)	# *E.* coli counted @ 24 hours	# *E.* coli CFU /100mL @ 24 hours	# *E.* coli counted @ 48 hours	# *E.* coli CFU /100mL @ 48 hours
EASYGEL – Sample 1		**A**		**A**	
EASYGEL – Sample 2		**A**		**A**	
EASYGEL – Sample 3		**A**		**A**	
3M Petrifilm – Sample 1		**B**		**B**	
3M Petrifilm – Sample 2		**B**		**B**	
3M Petrifilm – Sample 3		**B**		**B**	

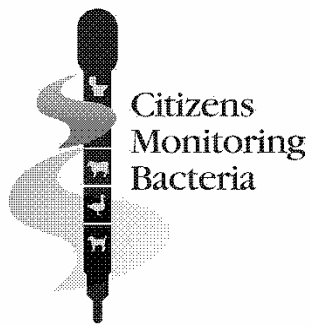
A = dark blue-purple colonies; **B** = blue (or red/blue) colonies with gas

Incubation Temperature _____ °C

Time Samples Placed in Incubator

_____

Bacteria analysis comments & observations (include time samples counted if different from 24 or 48 hours):



Revised 3/27/2006

CITIZENS MONITORING BACTERIA DATA SHEET

Date ____/____/____ Volunteer ID _____

Collection Time _____:_____ (am/pm) Site ID _____

Certified Monitor's Name _____

Stream/River Name _____

Current Weather

❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Worst Weather in Past 48 hrs.

❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Stream Flow

❒ High

❒ Normal

❒ Low

Air Temp _____ (°C)

Water Temp_____ (°C)

Transparency _____ (cm) or _____ (NTU)

(optional)

Stream assessment comments and observations:

For each method, please record the volume of sample water used, number of colonies counted, and incubation temperature, and time samples were placed in the incubator. Then calculate the number of *E.coli* colony forming units (CFUs) estimated per 100 mL of sample.

Test Method	Sample Volume (mL)	# *E.* coli counted @ 24 hours	# *E.* coli CFU /100mL @ 24 hours	# *E.* coli counted @ 48 hours	# *E.* coli CFU /100mL @ 48 hours
EASYGEL – Sample 1		**A**		**A**	
EASYGEL – Sample 2		**A**		**A**	
EASYGEL – Sample 3		**A**		**A**	
3M Petrifilm – Sample 1		**B**		**B**	
3M Petrifilm – Sample 2		**B**		**B**	
3M Petrifilm – Sample 3		**B**		**B**	

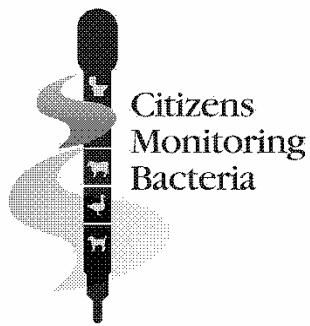
A = dark blue-purple colonies; **B** = blue (or red/blue) colonies with gas

Incubation Temperature _____ °C

Time Samples Placed in Incubator

_____

Bacteria analysis comments & observations (include time samples counted if different from 24 or 48 hours):



Revised 3/27/2006

CITIZENS MONITORING BACTERIA DATA SHEET

Date ____/____/____ Volunteer ID _____

Collection Time _____:_____ (am/pm) Site ID _____

Certified Monitor's Name _____

Stream/River Name _____

Current Weather

❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Worst Weather in Past 48 hrs.

❒ Clear/Sunny ❒ Overcast ❒ Showers ❒ Rain (Steady) ❒ Storm

Stream Flow

❒ High

❒ Normal

❒ Low

Air Temp _____ (°C)

Water Temp_____ (°C)

Transparency _____ (cm) or _____ (NTU)

(optional)

Stream assessment comments and observations:

For each method, please record the volume of sample water used, number of colonies counted, and incubation temperature, and time samples were placed in the incubator. Then calculate the number of *E.coli* colony forming units (CFUs) estimated per 100 mL of sample.

Test Method	Sample Volume (mL)	# *E.* coli counted @ 24 hours	# *E.* coli CFU /100mL @ 24 hours	# *E.* coli counted @ 48 hours	# *E.* coli CFU /100mL @ 48 hours
EASYGEL – Sample 1		A		A	
EASYGEL – Sample 2		A		A	
EASYGEL – Sample 3		A		A	
3M Petrifilm – Sample 1	1	B 17	1700	B	
3M Petrifilm – Sample 2		B		B	
3M Pet					

100 mls / 1 ml sample = 100

100 x 17 = 1700 cfu/100 mls sample

Incubation Temperature _____ °C

Time Samples Placed in Incubator

_____

Bacteria ana

Citizens Monitoring Bacteria

Revised 3/27/2006

Calculate average of triplicates

Easygel:

- Add number of mls of sample used
- Divide into 100 to get conversion factor
- Add number of colonies counted
- Multiply colonies by conversion factor

Example - Easygel

Mls Used	Colonies counted	Calculated cfu/100 mls
1	10	1000
3	28	924
5	44	880

Average:

(1000+924+880) / 3 =

935 cfu/100 mls

Correct calculation:

100 / 9 mls = 11.11 conv.factor

11.11 x 82 = 911 cfu/100 mls

Calculate average of triplicates

Petrifilm:

- Simple average

Enter data in data base

- **www.iwr.msu.edu/cmb**
- Password = ecoli (one word, lower case)
- Accepts all field data
- Will calculate triplicate averages
- Allows you to download your state data

Wrap up

- Questions?
- Complete & return evaluation (green)
- Complete post-test (yellow)

THANKS for coming!