Insights from the North Coast: Biosolids Record Keeping and Strategies for Compliance Assistance

Andrew Gall, P.E and Walter Ariss, P.E.
Environmental Specialist II
Ohio EPA Northwest District Office
The digester & drying beds are full!!!
Let’s Land Apply!
Not So Fast…
Check your records!
Check your records

- Is the site authorized?
- Are your soil samples current?
- Have you sampled the biosolids and reviewed the results?
- Do you have your certification statements?
- Have you calculated the Agronomic Rate?
- Notice and Necessary Information (NANI)
- Signage Placement Records
- Weather Records and Field Tile Monitoring
Biosolids Land Application Checklist

Ohio EPA Number: 02-00103

Field Identification Number: All 4-A

Field Location: Cole St at main office

☐ The field has been approved for biosolids application by OEP.

☐ A soil sample has been taken within past the 2 years.

☐ The soil pH is 5.5 or higher.

☐ The soil phosphorus level is less than 150 parts per million (300 pounds per acre)

Bray-Keith P1 extraction or 170 parts per million (three hundred forty pounds per acre)

Mehlich 3 extraction.

☐ The metals concentrations of the biosolids to be applied are less than the Table 3 concentration limits.

☐ The biosolids to be applied meets pathogen reduction alternative 1. (The geometric mean of the fecal coliform bacteria density in seven samples is less than 2,000,000 MPN per gram of total solids.)

☐ The biosolids have been analyzed for TKN, ammonia, phosphorous, potassium, pH, % total solids, and % volatile solids.

☐ The agronomic rate calculations have been performed.

☐ The farmer has been notified of the site restrictions.

☐ The isolation distances have been marked.

☐ The signage requirements have been met.

Date Signs Posted: _______________ Date Removed: _______________

☐ The farmer has been given an information sheet on the biosolids that were applied to this site.

As each requirement listed has been fulfilled, the person responsible is to place their initials on the line beside the requirement. After all requirements listed are fulfilled, the responsible person is to sign and date below.

Bill Griffin
Name

Signature

Date

Make a Checklist !!
Is the site authorized?

- OAC 3745-40-09 (C)
- Biosolids generator required to have the following on file:
  - Beneficial use site authorization application
  - Ohio EPA Site Authorization Letter

Ohio EPA

John K. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Renly, Director

March 14, 2013

Mr. Dave Pike, Superintendent
Wauseon Water Reclamation Plant
230 Clinton Street
Wauseon, Ohio 43567

Dear Mr. Pike:

Ohio EPA has reviewed the request to authorize beneficial use sites for land application of biosolids in Fulton County from the City of Wauseon Water Reclamation Plant. Ohio EPA has inspected the proposed sites and our findings and recommendations are as follows:

OEPA Site #26-00074: (Eric Richer Farm ER#1, ER#2) - This 50 acre site owned and farmed by Richer Farms is located on the south side of County Road D, just west of State Route 108 in Section 35 of Clinton Township. The major soil types at the site are Glynwood loam, Haskins loam, Hoyville clay loam, Mermill loam, Nappanee loam, Richer loamy fine sand and Seward loamy fine sand. Soil analytical results indicate an average pH value of 6.4 and a soil phosphorus value of 25 ppm (Bray Kurtz P1). This site is acceptable for the beneficial use of municipal biosolids from the City of Wauseon Water Reclamation Plant provided proper isolation distances are maintained from the house located on the north edge of the field along county Road D.

OEPA Site #28-00075: (Larry Richer Farm LR#1, LR#2, LR#3, LR#4) - This 163 acre site owned and farmed by Richer Farms is located on the south side of County Road D, just east of Township Road 15 in Section 35 of Clinton Township. The major soil types at the site are Blount loam, Haskins loam, Hoyville clay loam, Mermill loam, Nappanee loam, Richer loamy fine sand and Seward loamy fine sand. Soil analytical results indicate an average pH value of 5.9 and a soil phosphorus value of 48 ppm (Bray Kurtz P1). This site is acceptable for the beneficial use of municipal biosolids from the City of Wauseon Water Reclamation Plant provided proper isolation distances are maintained from the two houses located on the north edge of the field along county Road D and the house located near the southwest corner of the site.

This site has a soil phosphorus value greater than 40 parts per million Bray Kurtz P1 extraction. Please be aware that, in accordance with Ohio Administrative Code (OAC) 3745-40-08(A)(2)(b), after July 1, 2013, the agronomic rate at any beneficial use site shall be the most limiting factor derived from the following for the purpose of protecting waters of the state:

"For soils with soil phosphorus test results greater than forty parts per million Bray-Kurtz P1 extraction or forty-five parts per million Mehlich III extraction and less than or equal to one hundred parts per million Bray-Kurtz P1 extraction or one hundred fifteen parts per million Mehlich III extraction:

(a) The nitrogen agronomic rate; or
(b) A multi-year phosphate agronomic rate"
The site is not authorized if you don’t have copies of these items!
If your site is not authorized...

- **New Site Authorizations**
  - Submit completed beneficial use site authorization requests as soon as you know a new site needs to be authorized.
  - Sites are reviewed in the order they are received.
  - It takes Ohio EPA a minimum of 30 days to review a site request and issue a site authorization letter.
Ohio EPA Site Tracking
Are your soil samples current?

- Soil samples must be less than 3 years old
- Soil pH – Above 5.5
- Soil Phosphorus
  - Bray- Kurtz – P1
  - Mehlich 3
Have you sampled the Biosolids?

- **Metals**
- **Pathogens**
  - Fecal Coliform
- **Nutrients**
  - TKN
  - Ammonia
  - Phosphorus
  - Potassium
By July 1, 2015, any treatment plant who wishes to beneficially use biosolids must have a means of screening out manufactured inerts from the influent sewage and septage or sewage sludge.

This may be accomplished through fine screening (5/8” max aperture, but the finer the better) or other means approved by the Director.
<table>
<thead>
<tr>
<th>Pathogen Reduction</th>
<th>Vector Attraction Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 – Geometric Mean of 7 Fecal Coliform Samples</td>
<td>VAR1 – 38% Volatile Solids Reduction</td>
</tr>
<tr>
<td>P2 – Aerobic Digestion</td>
<td>VAR2 – Bench Scale Anaerobic Digestion</td>
</tr>
<tr>
<td>P3 – Air Drying</td>
<td>VAR3 – Bench Scale Aerobic Digestion</td>
</tr>
<tr>
<td>P4 – Anaerobic Digestion</td>
<td>VAR4 – Specific Oxygen Uptake Rate</td>
</tr>
<tr>
<td>P5 – Class B Composting</td>
<td>VAR5 – Aerobic process Time and Temperature</td>
</tr>
<tr>
<td>P6 – Lime Treatment</td>
<td>VAR6 – Lime Treatment</td>
</tr>
<tr>
<td>P7 – Equivalent Process to Significantly Reduce Pathogens</td>
<td>VAR7 – Greater Than or Equal to 75% Solids</td>
</tr>
<tr>
<td>P8 – Time and Temperature Regime</td>
<td>VAR8 – Greater Than or Equal to 90% Solids</td>
</tr>
<tr>
<td>P9 – High pH and High Temperature Process</td>
<td>VAR9 – Injection</td>
</tr>
<tr>
<td>P10 – Exceptional Quality Composting</td>
<td>VAR10 – Immediate Incorporation</td>
</tr>
<tr>
<td>P11 – Heat Drying</td>
<td></td>
</tr>
<tr>
<td>P12 – Thermophilic Aerobic Digestion</td>
<td></td>
</tr>
<tr>
<td>P13 – Beta Ray Irradiation</td>
<td></td>
</tr>
<tr>
<td>P14 – Gamma Ray Irradiation</td>
<td></td>
</tr>
<tr>
<td>P15 – Pasteurization</td>
<td></td>
</tr>
<tr>
<td>P16 – Equivalent Process to Further Reduce Pathogens</td>
<td></td>
</tr>
</tbody>
</table>

Note: Class B Biosolids can utilize any pathogen reduction alternative and vector attraction option.
Do you have your certification statements?

- Certify that you have reviewed the treatment records and sampling results to verify that pathogen reduction alternative and vector attraction reduction options have been met.
"Agronomic rate" means a rate of application of nutrients from any source to the land or an amount of nutrients removed by crop based on:

(1) Nutrient content of the biosolids to be applied;
(2) Nutrient needs of the current or planned crops; and
(3) Nutrient holding capacity of the soil.
Have you calculated the Agronomic Rate?

- Beginning July 2013, beneficial users have to evaluate phosphorus loadings as well as nitrogen loadings for beneficial use.

- The limits on application of phosphorus are based on the phosphorus soil tests for the beneficial use site.
Ohio EPA’s Agronomic Rate Calculation Spreadsheet!

<table>
<thead>
<tr>
<th>Soil Phosphorus Level (mg/kg Bray-Kurtz P1 extraction)</th>
<th>Agronomic Rate (use most limiting)</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nitrogen Rate</td>
<td>250 lbs/acre P2O5</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>0-40</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>1 Must be injected or incorporated within 24 hrs; or &gt;50% ground cover at time of beneficial use and no further phosphorus application for 3 yrs.</td>
<td></td>
</tr>
<tr>
<td>41-100</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Max of 5 yrs. and no further phosphorus application for number of years spread.</td>
<td></td>
</tr>
<tr>
<td>101-150</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>&gt;150</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Step 1 – General Information

- Enter Ohio EPA Site #
- Enter generator “Field ID”
- Enter “Generator Name”
Step 2– Biosolids Data

- Enter analytical results for the nutrients in the biosolids

- Answer question “will immediate incorporation or injection be performed?”
Step 3 – Beneficial Use Site Info

- Enter Soil Phosphorus Results & Analysis Method
- Select Hydrologic Soil Group from the drop down box
- Find using the USDA NRCS Web Soil Survey
Step 4 – Enter Crop Information

- Crops that will be grown (1-5 year rotation)
- Crop Nitrogen Requirement
- Account for residual available Nitrogen
  Refer to: *Tri-State Fertilizer Recommendations*
  [http://ohioline.osu.edu/e2567/index.html](http://ohioline.osu.edu/e2567/index.html)
- Account for Non-Biosolids Fertilizer Application Rates
# Residual Nitrogen Values

<table>
<thead>
<tr>
<th>Previous Crop</th>
<th>Nitrogen Credits (lbs/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn, small grains</td>
<td>0</td>
</tr>
<tr>
<td>Soybeans</td>
<td>30</td>
</tr>
<tr>
<td>Grass sod</td>
<td>40</td>
</tr>
<tr>
<td>Established forage legume</td>
<td>=40+20*(plants/ft^2)</td>
</tr>
<tr>
<td>Annual legume cover crop</td>
<td>30</td>
</tr>
</tbody>
</table>
Crop Information

- First year crop is corn-grain, expected yield of 200 bushels/acre

- Second year crop is soybeans, expected yield of 60 bushels/acre

- Third year crop is Wheat, expected yield of 90 bushels/acre
Which Rate to Use?

The soil phosphorus value is 48 ppm so we must use the most limiting of:

- Multi-year phosphate rate = 2.3 dry tons/acre
- Nitrogen Agronomic Rate = 7.0 dry tons/acre

Use Multi-year phosphate agronomic rate!!
Agronomic Rate Record Keeping

- Agronomic rate description
  - Must have documentation showing that equipment utilized for biosolids spreading has been calibrated.
  - Example would be calculating volume of spreader, pull at certain speed/rpm/gear until empty, measure area covered.
Signage Requirements

- **Signage**
  - Signs must be posted at all Class B biosolids beneficial use sites at least one week prior to delivery of Class B biosolids to the site.
  - Within 25ft. of field entrance from the public road
  - “Notice: Ohio EPA Authorized Class B Biosolids Beneficial Use Site. Trespassing Prohibited.”
Signage Posting Records

- Record of the dates the signs are posted and removed shall be maintained.
Precipitation restrictions for Class B biosolids

- No surface application when the forecast predicts a 50% chance that ½ inch (or ¼ inch for hydrologic soil group D) of rain will occur within 24 hours of beneficial use.

- Beneficial use may still occur if:
  » injection or immediate incorporation is used; or
  » if actual rainfall data indicates that ½ inch of rain did not occur even though the forecast predicted that it would.
Friday, April 25 at 11am
Precipitation Potential: 37%
Rain: Chance (30%-50%)
Frozen Snow Covered Ground

- Surface application of bulk biosolids to land from December 15 through March 1 is prohibited, unless injected or incorporated within 24 hours of application.

- Surface application of bulk biosolids to frozen and snow covered ground during the rest of the year will have to be in accordance with NRCS Waste Utilization Code 633.
  - Greater than 90% ground cover and not covered with snow/ice;
  - <5,000 gallons/acre if liquid;
  - <20 contiguous acres;
  - >200 feet from “waters of the state”;
  - <6% slope;
  - Visual outlet (drainage and tile) monitoring; and
  - <26 mg/L ammonia nitrogen at discharge.

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

WASTE UTILIZATION
(acre)
Code 633

DEFINITION
Using agricultural wastes such as manure and wastewater or other organic residues.

PURPOSES
1. Protect water quality
2. Provide fertility for crop, forage, fiber production
3. To provide nutrients for the production of forest products
4. Improve or maintain soil structure
5. Provide feedstock for livestock
6. Provide a source of energy

CONDITION WHERE THE PRACTICE APPLIES
This practice applies where agricultural wastes including animal manure and contaminated water from livestock and poultry operations, solids and wastewater from municipal treatment plants, and agricultural processing residues are generated, and/or utilized. When the term waste is used throughout this standard it refers to agricultural wastes including animal manure and contaminated water from livestock and poultry operations, solids and wastewater from municipal treatment plants, and agricultural processing residues.

CRITERIA
Criteria Applicable to All Purposes:
1. All federal, state and local laws, rules, and regulations governing waste management, pollution abatement, health and safety are to be strictly adhered to (See Section 1, EF-OTG). The owner or operator is responsible for securing any and all required permits or approvals related to waste utilization and for operating and maintaining any components in accordance with applicable laws and regulations.

2. The use of agricultural wastes (manure and wastewater) is to be based on at least one annual analysis of the material in storage. When wastes are stored/managed in different structures a minimum of one analysis is needed from each structure annually. As a minimum, the waste analysis is to identify Total N, Ammonium N, Organic N, P, K, and percent solids. NOTE: The initial nutrient content of manure and planned application rates from newly constructed or revised systems may be based on similar operations or accepted “book values” from the Midwest Pipeline Service (MWPS) 10, Section 1, 2000, or OSU Bulletin 694, or an approved NRCS Manures/Nutrient Management Software Program. Municipal and domestic wastewater, sludge, and septage are to be analyzed per the Ohio Environmental Protection Agency (OEPA) or other appropriate regulating agency’s rules and regulations.
Field Tile Monitoring

- If liquid biosolids are to be beneficially used, tile outlet monitoring shall occur before, during, and after beneficial use.

- Rates are limited to ½ inch or 13,000 gallons/acre/beneficial use event.

- Tools shall be used to disrupt preferential flow pathways during beneficial use or all tile outlets shall be plugged.

- If injected, only inject deep enough to cover biosolids with soil.

- Have tools available onsite to plug tiles, if necessary!
Now Lets Land Apply!!!
Notice and Necessary Information

- The biosolids generator is required to provide the land applier a copy of:
  - Metal testing results, PR and VAR results

- The land applier is required to provide the farm operator and land owner information a copy of the application rate and nutrients in the biosolids that were beneficially used.
The material you are receiving is or contains biosolids that have been treated to meet the requirements in Chapter 3745-40 of the Ohio Administrative Code.

Most recent analysis of biosolids:

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TKN</td>
<td>35,000</td>
<td>Hg</td>
<td>&lt;1</td>
<td>As</td>
<td>24</td>
</tr>
<tr>
<td>NH₄</td>
<td>7,000</td>
<td>Mb</td>
<td>15</td>
<td>Cd</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Total P</td>
<td>18,000</td>
<td>Zn</td>
<td>1,300</td>
<td>Se</td>
<td>4</td>
</tr>
<tr>
<td>Total K</td>
<td>3,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cu</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pb</td>
<td>75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ni</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pathogen Reduction Alternative P-1, Geometric Mean of Seven Fecal Coliform Samples, has been met. Vector Attraction Reduction Option VAR-1, 38% Volatile Solids Reduction, has been met.

The biosolids you are receiving are Class B, and shall be further treated, stored, transferred, disposed of, or beneficially used in accordance with Chapter 3745-40 of the Ohio Administrative Code, which may be found here:
http://www.epa.state.oh.us/dsw/rules/3745_40.aspx
Date 5-25-07

Dwain Metzger
3794 N. Cable Rd.
Lima, Ohio 45804

Dear Mr. Metzger

On May 7,8,9,10, 2006, biosolids from Shawnee II and Tank 4 at Am. Bath Wastewater Treatment Plant, Ohio EPA Permit 2PK00002*HD and 2PH00007*HD, were applied to the field located on Cole St. next to our driveway. Biosolids are a by-product of wastewater treatment.

Analysis of the biosolids showed the following concentrations:

<table>
<thead>
<tr>
<th></th>
<th>Shawnee</th>
<th>Am. Bath Tank 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Kjeldahl Nitrogen:</td>
<td>81,900 mg/kg</td>
<td>60,900 mg/kg</td>
</tr>
<tr>
<td>Ammonia Nitrogen:</td>
<td>7,800 mg/kg</td>
<td>11,100 mg/kg</td>
</tr>
<tr>
<td>Total Phosphorous:</td>
<td>31,000 mg/kg</td>
<td>29,400 mg/kg</td>
</tr>
<tr>
<td>Total Potassium:</td>
<td>7,030 mg/kg</td>
<td>8,240 mg/kg</td>
</tr>
</tbody>
</table>

Application Rates applied to the site:

- Available Nitrogen: 25.4 lbs/acre
- Phosphorous: 88.0 lbs/acre
- Potassium: 26.6 lbs/acre

The above information is supplied as a requirement of the Ohio EPA, Division of Surface Water, at 1-877-644-2001.

If you have any questions, please contact me at American-Bath Wastewater Treatment Plant, 3226 N. Cole St., Lima, Ohio 45801, or by phone at (419) 225-8048 Monday thru Friday between the hours of 7:30 am and 3:30 pm.

Sincerely,

Bill Griffin
Chief Sludge Operator
Allen County Sanitary Engineers
Andrew Gall
Environmental Specialist II
Division of Surface Water
Biosolids Program
419-373-3003
andrew.gall@epa.ohio.gov
Ohio EPA’s Biosolid Program Contacts

Chris Moody
Northeast District Office
Division of Surface Water
2110 East Aurora Road
Twinsburg, OH 44087

Phone: (330) 963-1118
Fax: (330) 487-0769
Email: chris.moody@epa.ohio.gov

Andy Gall
Northwest District Office
Division of Surface Water
347 North Dunbridge Road
Bowling Green, OH 43402

Phone: (419) 373-3003
Fax: (419) 352-8468
Email: andrew.gall@epa.ohio.gov

Betsy VanWormer
Central, Southeast, and Southwest District Offices
Division of Surface Water
P.O. Box 1049
Columbus, Ohio 43216-1049

Phone: (614) 644-2150
Fax: (614) 644-2745
Email: betsy.vanwormer@epa.ohio.gov
Strategies for Compliance Assistance

* Why is assistance needed

* Strategies: Administrative and Hands-on

* Continuing issues
In 2012

* 7 to 8% non compliance rate for major facilities
  * Half of the national average

* 22% non compliance rate for minor facilities
  * Over 300 facilities not compliant with effluent limits
Significant Non-Compliance (SNC)

* 40% exceedance of conventional pollutant for two or more months during six month review period

* 20% exceedance of toxic pollutants for two or more months during six month review period

* Violation of the same parameter for four or more months during six month review period
Major NPDES Permits - Percent of Facilities w/Significant Permit Limit Exceedance

Target = 10%

- NEDO
- NWDO
- SEDO
- SWDO
- CDO
- Overall

- Oct-Dec '12
- Jan-Mar '13
- Apr-Jun '13
- Jul-Sep '13
Minor NPDES Permits - Percent of Facilities with Significant Permit Limit Exceedance

- Target = 10%

Lines and markers represent different categories:
- NEDO
- NWDO
- SEDO
- SWDO
- CDO
- Overall

Time periods:
- Oct-Dec '12
- Jan-Mar '13
- Apr-Jun '13
- Jul-Sep '13

Percentages vary across the periods.
## Compliance Rates

<table>
<thead>
<tr>
<th></th>
<th>October -December 2012</th>
<th>January - March 2013</th>
<th>April - June 2013</th>
<th>July - September 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># in SNC</td>
<td>Total permits</td>
<td>%</td>
<td># in SNC</td>
</tr>
<tr>
<td>Major</td>
<td>18</td>
<td>245</td>
<td>7.30%</td>
<td>19</td>
</tr>
<tr>
<td>Minor</td>
<td>248</td>
<td>3180</td>
<td>7.80%</td>
<td>211</td>
</tr>
<tr>
<td>All</td>
<td>266</td>
<td>3425</td>
<td>7.80%</td>
<td>230</td>
</tr>
</tbody>
</table>
Screening of all DMRs submitted within 24 hours

PCR's are sent to E-mail address attached to eDMR account

NPDES permit requires response to OEPA
NOVs are issued based off DMRs that are submitted to Ohio EPA

Include a list of violations, language regarding possible penalty, description of steps to return to compliance
If violation was intermittent explain why you believe this

If the WWTP has already taken steps to address the violation provide details of actions

If the violation still needs addressed provide a timeline with specific actions that you will complete to come back into compliance
Administrative Strategy: Significant Non-Compliance (SNC) list

- SNC list generated and reviewed quarterly
- Facilities in SNC are contacted by district staff
- OEPA staff must complete a Compliance and Enforcement plan
CEPs are drafted by the District office to document a facility’s return to compliance approach.

Reviewed by enforcement supervisor and Central Office staff.

Used as a basis for enforcement cases.
Hands-on Strategy:

* EPA staff work with the operator to determine the causes for non-compliance

* Onsite visit with EPA staff, utilizing tools to evaluate the plant performance
Hands-on Strategy: Approach to Evaluating Plant

* Conversion
  * Ammonia to Nitrate-Nitrite
  * Alkalinity

* Separation
  * Keeping solids in the WWTP
Hands on Strategy: Tools We Have Available

* Settleometers
* Sludge Judge
* D.O. Meter
* Ammonia Test Kit
* Centrifuge
Hands on Strategy: Using the Tools

* Conversion
  * Ammonia test kit, D.O. Meter, Centrifuge

* Separation
  * Settleometer, Sludge Judge, Centrifuge

* Full evaluation can be complete in as little as half an hour
Process Control Reporting sheet

Date_________               Facility____________________              Design Flow____________

Conversion

Clarifier effluent Ammonia _____mg/l  Aeration tank effluent ammonia _____mg/l
Alkalinity _____ mg/l  Temperature_____  Aeration tank Dissolved Oxygen_______mg/l

Separation

Settlometer

(5mins) ______ml (10mins) _____ml (15mins) ______ml (20mins) ____ml (25 mins)____ml
(30mins )_____ml

Core Sampler

sludge depth_____ft

_____% of side water depth

Centrifuge Spin 15 min

RAS %_____  (target double the aeration basin%)

Aeration tank %_____  (range 2% to 4%)
Hands-on Strategy: What staff have learned

* Don’t assume anything, let the results guide your conclusions

* Alkalinity limited?

* Some issues are beyond operator control
  * Plant design flaws
  * Flow patterns
Hands on Strategy: Benefits

* OEPA staff can provide meaningful knowledge to the operator

* More detailed inspection reports from OEPA

* Better understanding of issues preventing compliance and identification of appropriate paths forward – can make return to compliance faster
Minimum criteria

- Identify treatment plant
- Date and times of arrival and departure of ORC
- Specific O&M duties that can/will affect effluent
- Results of tests unless on lab bench sheet
- Completion of PM or requests for maintenance that can/will affect effluent
- Identify person making entries
Continuing Issues: Operator’s Log Book

- Minimum 3 months data
- Available at treatment plant site
- Unacceptable entries
Continuing Issues: Laboratory Bench Sheets

* Lab tests help support your conclusions regarding plant operations

* Lab records need to be clear and well kept
Continuing Issues: Laboratory Inspection

* Common deficiencies
  * Temperature calibration
  * NIST weights
  * Sample collection and labeling
  * Calibration logs
  * BOD calculations
    * \((\text{initial DO-final DO}) \times 300\) ml of sample
QUESTIONS