June 2, 2009

The Honorable Mitch O'Brien
Mayor
City of Pickerington
100 Lockville Road
Pickerington, OH 43147

Dear Mayor O'Brien:

Enclosed is a report regarding a Compliance Evaluation Inspection that Jacob Howdyshell and I of the Ohio EPA performed at the City of Pickerington Wastewater Treatment Plant (WWTP). Mr. Howdyshell visited the WWTP on April 24, 2009, in response to concerns about odors and I visited the WWTP on May 19, 2009, to view the plant upgrade. Please read the report carefully since there are several items which require attention. The major items are listed as follows:

- At this time, the Pickerington WWTP is in violation of the State of Ohio Sewage Sludge Rules contained in Chapter 3745-40 of the Ohio Administrative Code. Specific problems are included in Item H in this inspection report. Written information must be submitted to Ohio EPA by June 22, 2009, that details how the referenced problems will be addressed.

- Item three (3) in the wastewater discharge permit requires written verification of work completion within 14 days of its completion. There has been no written notification from the City that work has been completed to comply with interim Total Dissolved Solids effluent limitations. Please advise this office in writing by June 22, 2009, regarding status of this work.

It was good to see progress has occurred thus far with expansion of the city's WWTP. The wastewater discharge permit indicates that the WWTP will be operational and meeting final effluent limitations by February 1, 2010.

If there are questions regarding sludge management please contact Jacob Howdyshell by telephone at (614) 644-2018 or by e-mail at jacob.howdyshell@epa.state.oh.us. For other questions you may contact Jan Rice by telephone at 614-728-3850 or by e-mail at jan.rice@epa.state.oh.us.

Sincerely yours,

Jan A. Rice
Environmental Specialist
Field Operations Unit
Division of Surface Water
Ohio EPA/CDO

Jacob Howdyshell
Environmental Specialist
Biosolids Unit
Division of Surface Water
Ohio EPA/CO

JAR/JH/nsm Pickerington 5-19-09 CEIS cover letter

NPDES
Compliance Inspection Report

A. NATIONAL DATA SYSTEM CODING

Permit No.	NPDES No.	Date	Inspection Type	Inspector	Facility Type
4PB00017	OH0031119	5/19/09	C	S	1

B. FACILITY DATA

Name and Location of Facility Inspected	Entry Time	Permit Effective Date
City of Pickerington Wastewater Treatment Plant (WWTP) 525 South Hill Road Pickerington, Ohio 43147	9:00 A.M.	1/1/08
	Exit Time	**Permit Expiration Date**
	11:00 A.M.	12/31/12
Name(s) and Title(s) of On-Site Representative(s)		**Phone Number(s)**
Kent Sanderson, Chief Operator		614-837-6470
Name(s), Address and Title(s) of Operator of Record		**Phone Number(s)**
Name, Address and Title of Responsible Official		**Phone Number**
Mitch O'Brien, 100 Lockville Road, Pickerington, Ohio 43147 Mayor		614-837-3974

C. AREAS EVALUATED DURING INSPECTION (S = Satisfactory, M = Marginal, U = Unsatisfactory, N = Not Evaluated)

S	Permit
S/S	Records/Reports
M/S	Operations & Maintenance – sludge management needs improvement to minimize odors.
S	Facility Site Review
N	Collection System
S	Flow Measurement
S	Laboratory
M/M	Effluent/Receiving Waters – infrequent effluent limitations violations. No sludge deposits noted in stream. The Walnut Creek Technical Support Document indicates Sycamore Creek is impacted by total dissolved solids discharge from this WWTP.
U/S	Sludge Storage/Disposal – sludge storage time reported as now being approximately 70 days with no contracted storage alternative arrangements currently in place. Alternative storage arrangements must immediately be developed.
N	Pretreatment
M	Compliance Schedules – the permittee needs to review the permit compliance schedule to ensure that required information is submitted on time.
S	Self-Monitoring Program

D. SUMMARY OF FINDINGS/COMMENTS: This WWTP is currently undergoing an expansion which is scheduled to be completed by February 1, 2010. The expansion will help address several problems noted in this report but will not provide a means for providing consistent compliance with the total dissolved solids final effluent limitation. The permittee is continuing review of options necessary to comply with the total dissolved solids limitation contained in this wastewater discharge permit.

Jan Rice, Inspector, Ohio EPA, Central District Office — Date

Erin Sherer, Reviewer, Ohio EPA, Central District Office — Date

Sections E through K: Complete on all inspections as appropriate (N/A = Not Applicable N/E = Not Evaluated)

E. PERMIT VERIFICATION

Inspection Observations Verify the Permit	Yes	No	N/A	N/E
a. Correct name and mailing address of permittee	X			
b. Correct name and location of receiving waters	X			
c. Product(s) and production rates conform with permit application (industries)			X	
d. Flows and loadings conform with NPDES permit	X			
e. Treatment processes are as described in permit application/briefing memo	X			
f. New treatment process(es) added since last inspection		X		
g. Notification given to state of new, different, or increased discharges	X			
h. All discharges are permitted	X			
i. Number and location of discharge points are as described in permit	X			

F. COMPLIANCE SCHEDULES/VIOLATIONS

	Yes	No	N/A	N/E
a. Any significant violations since the last inspection	*X			
b. Permittee is taking actions to resolve violations	X			
c. Permittee has compliance schedule	X			
d. Compliance schedule contained in permit	X			
e. Permittee is meeting compliance schedule	*X			

Comments: *a. effluent limitations violations are listed in Attachment "A" of this report.

*e. Item 1a. - PTI due 2/1/08; submitted 2/19/08. Item 1b. - construction initiation due by 8/1/08; started 10/27/08. Item 2a. – TDS status report due 7/1/08; submitted 7/18/08. Item 2b. – compliance with interim TDS limit due by 1/1/09; no final effluent TDS violations as of 3/31/09 for permit effective 1/1/08. Item 3 requires written verification of work completion within 14 days of completion. There has been no written notification by the permittee of work completion to comply with interim TDS effluent limitations. The permittee must advise this office in writing by June 22, 2009 regarding status of work required in Item 2b.

G. OPERATION AND MAINTENANCE

Treatment Facility Properly Operated and Maintained	Yes	No	N/A	N/E
a. Standby power available: Generator X Dual Feed ____	X			
b. Adequate alarm system available for power or equipment failures	X			
c. All treatment units in service other than backup units	X			
d. Sufficient operating staff provided: # of shifts: 1 Days/Week: 5 with weekend checks	X			
e. Operator holds unexpired license of class required by permit Class: III	X			
f. Routine and preventive maintenance schedule/performed on time	X			
g. Any major equipment breakdown since last inspection		*X		
h. Operation and maintenance manual provided and maintained		*X		
i. Any plant bypasses since last inspection		X		
j. Regulatory agency notified of bypasses ____ on MORS ____ 800 Number			X	
k. Any hydraulic and/or organic overloads experienced since last inspection		X		

Comments: *g. one of four influent pumps is out of service being repaired. *h. an Operation and Maintenance Program Development Plan dated 9/22/08 has been prepared by Ohio EPA and the permittee to summarize activities that the permittee will undertake to operate and maintain its WWTP.

Collection System (overseen by the permittee street department) a. Percent combined system: 0%	Yes	No	N/A	N/E
b. Any collection system overflows since last inspection (CSO ____ SSO ____)		X		
c. Regulatory agency notified of overflow (SSOs)			X	
d. CSO O and M plan provided and implemented			X	
e. CSOs monitored and reported in accordance with permit			X	
f. Portable pumps used to relieve system		X		
g. Lift station alarm systems provided and maintained (overseen by WWTP staff)	X			
h. Are lift stations equipped with permanent standby power or equivalent	X*			
i. Is there an inflow/infiltration problem (separate sewer system), or were there any major repairs to collection system since last inspection	*X			
j. Any complaints received since last inspection of basement flooding		X		
k. Are any portions of the sewer system at or near capacity		*X		

Comments: *h. a trailer mounted generator is now connected to the D Line lift station. Another portable generator was recently purchased. A portable pump is available for use if necessary. The five lift stations in the collection system are monitored by a SCADA system.

*i. service manager Ed Drobina indicated repairs have been made as necessary in the collection system in the old part of Pickerington.

*k. service manager Ed Drobina indicated a sanitary sewer system master study planned for 2009 will include sewer system flow monitoring.

H. SLUDGE MANAGEMENT

a. Sludge Management Plan (SMP):

_____ Submitted Date
_____ Approval Number
_____ Not submitted
_____ N/A

	Yes	No	N/A	N/E
b. Sludge Management Plan current		X		
c. Sludge adequately disposed (Method: Land Application)	X			
d. If sludge is incinerated, where is ash disposed of? _____			X	
e. Is sludge disposal contracted (Name: Synagro)	X			
f. Has amount of sludge generated changed significantly since last inspection				X
g. Adequate sludge storage provided at plant		*X		
h. Land application sites monitored and inspected per SMP	X			
i. Records kept in accordance with state and federal law	X			
j. Any complaints received in last year regarding sludge	*X			
k. Is sludge adequately processed (digestion, dewatering, pathogen control)		*X		

Comments: *g., j. and k. On April 24, 2009, Ohio EPA representative Jacob Howdyshell conducted an inspection at this WWTP. The purpose of the inspection was to determine compliance with the Ohio Sewage Sludge Rules, Chapter 3745-40 of the Ohio Administrative Code (OAC). Mr. Rick Barnes, Utilities Operator, and Mr. Harold Brown, Technical Services Manager, were present and provided information on sludge operations and record keeping. The inspection included a walkthrough of the plant, a review of sewage sludge records, and completion of the enclosed checklist.

The current method of sludge treatment is to send secondary sludge to a series of two aerated digesters, with a capacity

of approximately 240,000 gallons each. Sewage sludge is then removed from the aerated tanks and sent to the belt press on site. After pressing, the sludge is stored on one of three concrete storage pads, capacity of approximately 100 wet tons each, until it is removed for land application.

During the inspection, the following deficiencies were discovered in regards to sewage sludge management and record keeping:

- OAC 3745-40-05(T) states the following:

  Facility storage of sewage sludge shall be provided by the permittee such that there shall be no adverse effects from sewage sludge handling at the permittee's treatment works. Facility storage of sewage sludge shall consist of one hundred twenty days sewage sludge storage for the design capacity of the treatment works. Facility storage of sewage sludge may consist of any combination of additional volume in sludge stabilization units (digesters), separate tanks, sewage sludge treatment lagoons, drying beds, dewatered sewage sludge storage pad areas, or other means to store either liquid or dewatered sewage sludge. In lieu of some of the one hundred twenty day facility storage of sewage sludge requirement, a permittee may demonstrate to the director that they have engineered or contracted alternatives to facility storage of sewage sludge in place. Alternatives to facility storage of sewage sludge include, but are not limited to, the following:

  (1) Contracts in effect with a sanitary landfill and sufficient transportation to dispose of sewage sludge that cannot be otherwise managed through facility storage of sewage sludge or other means of use or disposal;

  (2) Contracts in effect with another permitted facility and sufficient transportation to transfer sewage sludge that cannot be otherwise managed through facility storage of sewage sludge or other means of use or disposal; or

  (3) Ownership or leasing of, or contracts in effect with, a regional storage of sewage sludge facility and sufficient transportation to transfer sewage sludge that cannot be otherwise managed through facility storage of sewage sludge or other means of use or disposal.

  At the time of my inspection, Mr. Barnes stated that the current storage capacity for sewage sludge at the treatment works is approximately 70 days and that there are no contracted alternatives to storage at the Pickerington WWTP at this time. The permittee shall immediately seek out a contracted alternative to facility storage of sewage sludge to come into compliance with this rule until construction at the treatment plant is complete and facility storage has been increased to the required amount.

- OAC 3745-40-05(M) states the following:

  "One of the vector attraction reduction requirements in paragraphs (Q)(1) to (Q)(10) of this rule shall be met when sewage sludge is applied to the land."

  At the time of my inspection, the treatment plant was claiming to be meeting vector attraction reduction by meeting the requirements for a specific oxygen uptake rate (SOUR) test. Although dissolved oxygen monitoring sheets were available, there were no calculations done to show that SOUR had indeed met the regulations. The treatment plant shall immediately start performing all of the necessary requirements to meet the SOUR test, or shall perform another vector attraction reduction alternative to meet the requirements of this rule. I have included an example of a bench sheet (see Attachment "B") that may be used for the SOUR test in the future. The example sheet includes the required calculations to determine the actual SOUR of the sewage sludge.

- OAC 3745-40-06(I) requires that the permittee who provides treatment to bulk sewage sludge develop and sign the following certification statements:

  "I certify, under penalty of law, that the information that will be used to determine compliance with class (insert A or B) pathogen reduction alternative (insert one of the class A alternatives in paragraphs (N)(1) to (N)(6) of rule 3745-40-05 of the Administrative Code or one of the class B alternatives in paragraphs (O)(1) to (O)(3) of rule 3745-40-05 of the Administrative Code) was prepared under my direction and supervision in accordance

with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

and

"I certify, under penalty of law, that the information that will be used to determine compliance with vector attraction reduction requirement (insert one of the vector attraction reduction requirements in paragraphs (Q)(1) to (Q)(8) of rule 3745-40-05 of the Administrative Code) was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

The WWTP shall develop these certification statements and sign them in accordance with paragraph 3745-31-04 of the Ohio Administrative Code (according to that paragraph the superintendent of the WWTP shall sign the statements). These statements shall be developed and signed at the end of each reporting period to verify the pathogen and vector attraction reduction for that reporting period. The statements must be kept for 5 years and copies of the statements shall be submitted yearly with the annual sewage sludge use/disposal report.

- OAC 3745-40-06(I) requires that the permittee who provides treatment to bulk sewage sludge develop a description of how the pathogen reduction requirements of rule 3745-40-05 of the Administrative Code are met and a description of how the vector attraction reduction requirements of rule 3745-40-05 of the Administrative Code are met, and keep these descriptions for a minimum of five years and make them available to the Ohio EPA upon request.

  At the time of the inspection, these descriptions were not available. The WWTP shall develop these descriptions to keep on file at the treatment plant.

One reason for Ohio EPA's inspection has been the gradual increase in odors generated by the Pickerington WWTP sewage sludge over the last year. At this time, it is believed that the odors are being generated by a lack of detention time in the digesters. Observing three different stockpiles of sludge on the storage pads, it appears that the sludge is continuing to digest on the pads, which may be generating the odors. Ohio EPA suggests treating sludge by operating the two digesters in series and actively decanting to thicken the sludge as much as possible, increasing the detention time in the digesters. At the time of my inspection, it appeared that the digesters were being utilized in a parallel manner, as sludge in both of the digesters was at the same level and appeared to be of the same consistency.

At this time, the Pickerington WWTP is in violation of Chapter 3745-40 of the Ohio Administrative Code. By June 22, 2009, information must be submitted to Ohio EPA that details how the above deficiencies will be addressed.

Pages 6 through 17 of this report provide an additional sewage sludge land application checklist used during this inspection.

SEWAGE SLUDGE LAND APPLICATION INSPECTION

Date of Inspection: 4/24/09
Inspector Name: JACOB HOWDYSHELL

Facility Name PICKERINGTON

Facility Address: 525 HILL RD S	Mailing Address: 100 LOCKVILLE RD.
City: PICKERINGTON	City: PICKERINGTON
Zip:	Zip: 43147

Contacts Present

Name: RICK BARNES	Name: HAROLD BROWN
Title: UTILITIES OPERATOR	Title: TECH. SERVICES MANAGER
Phone: (614) 837-6470	Phone:
Fax:	Fax:

I. Facility Information

Facility Background

Average Daily Flow (MGD)	1.3
Sewage Sludge Class	EQ (B) Unknown
Sewage Sludge Storage Capacity (Days)	70
Contracted Alternative (if applicable)	NOT YET

Facility Sewage Sludge Treatment Process(es)

Treatment Process	# Units	Notes
AEROBIC DIGESTERS	2	470,000 GALLONS TOTAL
BELT PRESS	1	
(B) STORAGE PADS	3	~100 WET TON EACH

II. Management Practices

General Facility Sewage Sludge Treatment

Yes No N/A	1. Are the sewage sludge treatment units being operated/maintained in accordance with the manufacturer's specifications?
Yes No N/A	2. Does the facility have adequate equipment redundancy (ie. back-up sewage sludge treatment units)?
Yes No N/A	3. Does the facility have any plans for upgrades to any of the sewage sludge treatment units? If so, explain: 2 NEW DIGESTERS
Yes No N/A	4. Does the facility have a contingency plan for sewage sludge disposal?
Yes No N/A	5. Is the sewage sludge handling operation adequate to manage the volume of sewage sludge generated?
Comments:	– WILL BE WORKING ON CONTINGENCY PLAN

Drying Beds, Gravity Thickener, Centrifuge, and Dissolved Air Floatation ☒ N/A

Average percent (%) solids before thickening:		Average percent (%) solids before thickening:	

Yes No N/A	1. Is primary unstabilized sewage sludge fed to the drying beds, gravity thickener, or centrifuge?
Yes No N/A	2. Is the sewage sludge mixed with other materials, including coagulants, before or after thickening?

Average percent (%) solids before mixing sewage sludge with other materials:	

Comments:	

Aerobic Digestion ☐N/A

	1. Sewage sludge fed to the aerobic digester includes: ☐ Primary ☒ Secondary ☐ Combined
Yes No (N/A)	2. Aerobic digester is operated at proper temperature? ☐ Cryophilic (<10° C = <50° F) ☐ Mesophilic (10° to 42° C = 50° to 108° F) ☐ Thermophilic (>42° C = >108° F)
Comments:	~ 25 - 30 DAYS DETENTION TIME

Anaerobic Digestion ☒N/A

	1. Sewage sludge fed to the aerobic digester includes: ☐ Primary ☐ Secondary ☐ Combined
	2. Anaerobic digester operating mode: ☐ High Rate* ☐ Low Rate *Utilize a combination of active mixing and elevated temperatures.
Yes No N/A	3. Aerobic digester is operated at proper temperature? ☐ Cryophilic (35°C = 95° F) ☐ Thermophilic (55° C = 131° F)
Comments:	

Composting ☒N/A

	1. Type of sewage sludge composting performed: ☐ In Vessel ☐ Static Piles ☐ Windrows

	2. Type of sewage sludge composted includes: ☐ Primary ☐ Secondary ☐ Combined
Yes No N/A	3. Is the moisture content of the composting operation monitored?
Yes No N/A	4. Is the compost mixed? If so, number of turnings:
Yes No N/A	5. Is the oxygen content of the compost monitored?
Yes No N/A	6. Is the temperature of the compost monitored?
Yes No N/A	7. Are total and total volatile solids of the compost monitored?
Yes No N/A	8. Active Phase (days): Curing Phase (days):
Comments:	

Land Application ☐N/A

	1. Sewage sludge is applied to: ☒ Authorized Sewage Sludge Site ☐ Unauthorized Sewage Sludge Site ☐ Forest ☐ Reclamation Site ☐ Lawn or Garden ☐ Public Contact Site (ie. park, etc.)

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Yes No N/A	2. Are Class A pathogen reduction requirements met (indicate method being performed)? ☐ Alt. 1 - Fecal Coliform <1,000 MPN/g total solids, or Salmonella <3 MPN/4 g total solids, and time/temperature: ☐ >7% solids at >50° C (>122°F) for >20 minutes (no warmed gases or immiscible liquid). ☐ >7% solids at >50° C (>122°F) for >15 seconds (warmed gases or immiscible liquid). ☐ <7% solids at X° C for >15 seconds to <30 minutes. ☐ <7% solids at >50° C (>122°F) for >30 minutes. ☐ Alt. 2 - Fecal Coliform <1,000 MPN/g total solids, or Salmonella <3 MPN/4 g total solids, and pH > 12 for 72 hours. ☐ Alt. 3 - Fecal Coliform <1,000 MPN/g total solids, or Salmonella <3 MPN/4 g total solids, and other processes: ☐ Enteric virus is <1 plaque forming unit (PFU) per 4 grams of total solids (TS) **PRIOR** to pathogen treatment (PT). ☐ Enteric virus is >1 PFU per 4 grams of TS prior to PT but is <1 per 4 grams of TS **AFTER** PT. ☐ Helminth ova is <1 per 4 grams of TS **PRIOR** to PT. ☐ Enteric virus >1 PFU per 4 grams of TS prior to PT, but is <1 per 4 grams of TS **AFTER** PT. ☐ Alt. 4 - Fecal Coliform <1,000 MPN/g total solids, or Salmonella <3 MPN/4 g total solids, and unknown processes: ☐ Enteric virus is <1 PFU per 4 grams of TS at disposal. ☐ Helminth ova is <1 per 4 grams of TS at disposal. ☐ Alt. 5 - Fecal Coliform <1,000 MPN/g total solids, or Salmonella <3 MPN/4 g total solids, and PFRP: ☐ 1. Composting. ☐ 2. Heat drying. ☐ 3. Heat treatment. ☐ 4. Thermophilic aerobic digestion. ☐ 5. Beta ray irradiation. ☐ 6. Gamma ray irradiation. ☐ 7. Pasteurization. ☐ Alt. 6 - Equivalent process.

Yes No N/A	3. Are Class B pathogen reduction requirements met (indicate method being performed)? ☒ Alt. 1 -Geometric mean of seven Fecal Coliform samples with <2,000,000 MPN/g total dry solids or <2,000,000 Colony Forming Units/g total dry solids. ☐ Alt. 2 - PSRP 1 aerobic digestion. Mean cell residence time and temperature shall be between 40 days at 20°C (68°F) and 60 days at 15°C (59°F). Average mean cell residence time (days): ☐ Average temperature (°C) : ☐ ☐ PSRP 2 air drying. Sewage sludge dried on sand beds or basins for 3 months at an ambient average daily temperature >0°C (>32°F) ☐ PSRP 3 anaerobic digestion. Mean cell residence time and temperature shall be between 15 days at 35°-55°C (95°-131°F) and 60 days at 20°C (68°F). Average mean cell residence time (days): ☐ Average temperature (°C) : ☐ ☐ PSRP 4 composting. Sewage sludge temperature is raised to >40°C (>104°F) for 5 days. Temperature must exceed 55°C (>131°F) for 4 hours during the 5 day period. ☐ PSRP 5 lime treatment. Lime is added to sewage sludge to raise the pH to 12 after 2 hours of contact.
Yes No N/A	4. Are the Class B signage requirements being satisfied?

Yes No N/A	5. Are Class B site restrictions being practiced (indicate restrictions being performed)? ☐ Food crops (above ground) are harvested >14 months after sewage sludge application. ☐ Food crops (below ground) are harvested >20 months after sewage sludge application when sewage sludge remains on ground >4 months before soil incorporation. ☐ Food crops (below ground) are harvested >38 months after sewage sludge application when sewage sludge remains on ground <4 months before soil incorporation. ☒ Food crops, feed crops, and fiber crops are harvested >30 days after sewage sludge application. ☒ Animal grazing allowed on land only >30 days after sewage sludge application. ☐ Turf grown on land where sewage sludge was applied not harvested for >1 year if placed on land with high potential for public exposure or lawn. ☐ Public access restricted to land with a high potential for public exposure for 1 year. ☒ Public access restricted to land with a low potential for public exposure for 30 days.

Yes No N/A	6. Are bulk sewage sludge site restrictions being practiced (indicate restrictions being performed)? ☒ No threatened or endangered species present or critical habitat affected at the site where sewage sludge is applied. ☒ Bulk sewage sludge is not applied to frozen or snow covered ground unless applied >100 feet from waters of the state and appropriate ground cover maintained. ☒ Bulk sewage sludge is not applied <33 feet from waters of the state. ☒ Bulk sewage sludge is applied at a rate equal or less than the agronomic rate. ☒ Label affixed no bag or information sheet provided to user of sold and given away sludge indicating name of sludge preparer, application instruction, and maximum annual whole sludge application rate.
Yes No N/A	7. Are bulk sewage sludge general requirements being practiced (indicate restrictions being performed)? ☑ Sewage sludge is not applied to a site where the cumulative pollutant loading or annual application rate has been reached.. ☑ Notification given to the sludge applier regarding total nitrogen content of the sludge. ☑ Sufficient information required to comply with OAC 3745-40. ☑ Sewage sludge site authorization packet submitted to Ohio EPA regarding the location of land application sites, appropriate NPDES permit numbers.

(Yes) No N/A	7. Is a vector attraction reduction method being met (indicate method being performed)? ☐ 38% Volatile Solids Reduction. VS Red. = (VS In - VS Out) / ((VS In) - (VS, In x VS, Out)) x 100% ☐ 40-day bench scale test. Volatile Solids reduced <17% (anaerobic digestion only) ☐ 30-day test bench scale . Volatile Solids reduced <15% (aerobic digestion only) ☑ Specific Oxygen Uptake Rate <1.5 mg/hr/gm Total Solids at 20°C (68°F). ☐ Aerobic process for >14 days at >40°C (104°F) with average sewage sludge temperatures at 45°C (113°F). ☐ pH >12 for 2 hours and pH >11.5 for 22 hours. ☐ Sewage sludge with no unstabilized solids contains >75% Total Solids prior to mixing with other materials. ☐ Sewage sludge with unstabilized solids contains >90% Total Solids prior to mixing with other materials. ☐ Subsurface injection. ☐ Soil incorporation within 6 hours for Class B or within 8 hours for EQ.
Comments:	BENCH SHEETS AVAILABLE, BUT NO FINAL SOUR #.

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Other Management Practices ☒ N/A

	1. The facility performs another sewage sludge treatment process (indicate which other management practice is being performed) ☐ Surface Disposal. ☐ Landfilling. ☐ PPG Lime Lakes.
Comments:	

III. NPDES Permit Verification

(Yes) No N/A	1. Are OAC 3745-40 sewage sludge frequency and monitoring parameters contained in the facility's current NPDES permit?
	2. Sewage sludge disposal practice(s): A. Land Application ☒ Bulk Sewage Sludge ☐ Bulk Material Derived from ☐ Sewage Sludge Sold or Given ☐ Away in Bag or Other Container B. Surface Disposal ☐ C. Sewage Sludge Incineration ☐ D. Onsite or Offsite Disposal ☐ E. Other:
(Yes) No N/A	3. Is the sewage sludge disposal practice authorized by current NPDES permit?
(Yes) No N/A	4. If the authorized sewage sludge disposal practice changes, will notification be given to Ohio EPA prior to the change?
(Yes) No N/A	5. The facility is utilizing sewage sludge land application sites that have been previously authorized by Ohio EPA.
Comments:	

Monitoring and Reporting

MORE	Yes (No) N/A	1. Is facility self-monitoring occurring at the frequencies specified for the parameters located in the facility's NPDES permit or OAC 3745-40?
	(Yes) No N/A	2. Is the facility reporting parameters using Ohio EPA form 4500?
	(Yes) No N/A	3. Is facility self-monitoring data available for all regulated pollutants for the previous five years?
	(Yes) No N/A	4. Do monthly operating reports show pollutant concentrations below ceiling concentrations shown in OAC 3745-40-05(F)(1)?
	(Yes) No N/A	5. Do monthly operating reports show pollutant concentrations below monthly average concentrations shown in OAC 3745-40-05(F)(3)?
	Yes No (N/A)	6. Are general requirements and management practices applied for sewage sludge not meeting monthly average concentrations shown in OAC 3745-40-05(F)(3)?
	(Yes) No N/A	7. Are sewage sludge records adequate to assess compliance with annual and/or cumulative pollutant loading rates?
WILL DEVELOP	Yes (No) N/A	8. Are pathogen and vector attraction reduction method descriptions and certification statements available for the previous five years?
	(Yes) No N/A	9. Are records available for all sewage sludge use or disposal practices available for the previous five years?
	(Yes) No N/A	10. Have the facility's sewage sludge sites been tested for pH and Phosphorus within two years of land application?
	(Yes) No N/A	11. Are accurate records of sewage sludge volume or mass maintained for the previous five years?
SYNAGRO PULLING AS WELL	(Yes) No N/A Yes (No) N/A	12. Are monitoring and analysis being performed more frequently than required by the facility's NPDES permit? If so, are the results being reported to Ohio EPA?
FINAL CALC FOR SOUR	Yes (No) N/A	13. Do sewage sludge treatment unit operation records verify compliance with pathogen reduction and vector attraction reduction requirements, when appropriate?
	(Yes) No N/A	14. Are sewage sludge samples taken at the locations specified in the facility's NPDES permit?

Yes No N/A	15. Are sewage sludge sample locations and methods appropriate for obtaining representative samples?
Yes No N/A Yes No N/A Yes No N/A Yes No N/A Yes No N/A	16. Sample collection procedures: A. Adequate sample volumes obtained? B. Proper preservation techniques utilized? C. Containers conform to appropriate analytical methods specified in OAC 3745-40? D. Samples analyzed within the appropriate time frames specified in OAC 3745-40?
Yes No N/A	17. Are analytic results reported on a dry weight basis (mg/kg)?
Yes No N/A	18. Are samples refrigerated subsequent to compositing?
Yes No N/A	19. Are chain-of-custody procedures employed?
Yes No N/A	20. Are the analytic methods used approved in OAC 3745-40?
Comments:	

- STORAGE
- FINAL NUMBERS SOUR
- DEVELOP SOP'S & CERTS.
- CONTINGENCY

I. SELF-MONITORING PROGRAM

Part 1 - Flow Measurement	Yes	No	N/A	N/E
a. Primary flow measuring device properly operated & maintained. Type of device: X ultrasonic & parshall flume — calculated from influent ___ weir — Other ___ ultrasonic & weir — Specify: _____				
b. Calibration frequency adequate (date of last calibration 6/08)	X			
c. Secondary instruments (totalizers, recorders etc.) properly operated and maintained	X			
d. Flow measurement equipment adequate to handle expected ranges of flows	X			
e. Actual flow discharged is measured	X			
f. Flow measuring equipment inspection frequency: X Daily ___ Weekly ___ Monthly ___ Other				

Part 2 - Sampling	Yes	No	N/A	N/E
a. Sampling location(s) are as specified by permit	X			
b. Parameters and sampling frequency agree with permit	X			
c. Permittee uses required sampling method	X			
d. Sample collection procedures are adequate	X			
i. Samples refrigerated during compositing	X			
ii. Proper preservation techniques used				
Conform with 40 CFR 136.3	X			
e. Monitoring records (e.g., flow, pH, D.O., etc.) maintained for a minimum of three years including all original strip chart recordings (e.g., continuous monitoring instrumentation, calibration, and maintenance records)	X			
f. Adequate records maintained of sampling date, time, exact location, etc.	X			

Part 3, Laboratory - General	Yes	No	N/A	N/E
a. EPA approved analytical testing procedures used (40 CFR 136.3)	X			
b. If alternate analytical procedures are used, proper approval has been obtained			X	
c. Analyses being performed more frequently than required by permit		X		
d. If (c) is yes, are results reported in permittee's self-monitoring report			X	
e. Commercial laboratory used 1. Parameters analyzed by commercial lab: O/G, metals,mercury, toxicity testing, phosphorus, total dissolved solids and bis92-ethylhexyl)Phthalate 2. Lab name: Stantec	X			

Part 3, Laboratory - Quality Control/Quality Assurance	Yes	No	N/A	N/E
f. Quality assurance manual provided and maintained	X			
g. Satisfactory calibration and maintenance of instruments and equipment	X			
h. Adequate records maintained	X			
i. Results of latest U.S. EPA quality assurance performance sampling program: Date: the permittee participated in DMRQA 28 but Ohio EPA program results are not yet available. ___ Satisfactory ___ Marginal ___ Unsatisfactory				

J. EFFLUENT/RECEIVING WATER OBSERVATIONS

Outfall #	Oil Sheen	Grease	Turbidity	Visible Foam	Visible Float Solids	Color	Other
1	None	None	None	Slight	None	Clear	

K. MULTIMEDIA OBSERVATIONS

	Yes	No	N/A	N/E
a. Are there indications of sloppy housekeeping or poor maintenance in work and storage areas or laboratories		X		
b. Do you notice staining or discoloration of soils, pavement, or floors		X		
c. Do you notice distressed (unhealthy, discolored, dead) vegetation		X		
d. Do you see unidentified dark smoke or dustclouds coming from sources		X		
e. Do you notice any unusual odors or strong chemical smells		X		
f. Do you see any open or unmarked drums, unsecured liquids, or damaged containment facilities		X		

City of Pickerington WWTP
Effluent Limitations Violations
5/1/07 – 3/31/09
Outfall Monitoring Station 4PB00017001

Permit No	Reporting Period	Station	Reporting Code	Parameter	Limit Type	Limit	Reported Value	Violation Date
4PB00017*KD	May 2007	001	00515	Residue, Total Dissolv	30D Conc	1710	1933.33	5/1/2007
4PB00017*KD	June 2007	001	00515	Residue, Total Dissolv	30D Conc	1710	2380.58	6/1/2007
4PB00017*KD	July 2007	001	00515	Residue, Total Dissolv	30D Conc	1710	2177.83	7/1/2007
4PB00017*KD	August 2007	001	00515	Residue, Total Dissolv	30D Conc	1710	1799.25	8/1/2007
4PB00017*KD	September 2007	001	00515	Residue, Total Dissolv	30D Conc	1710	1929.08	9/1/2007
4PB00017*KD	October 2007	001	00515	Residue, Total Dissolv	30D Conc	1710	1732.5	10/1/2007
4PB00017*LD	September 2008	001	00610	Nitrogen, Ammonia (NH3	7D Conc	1.4	2.5	9/1/2008
4PB00017*LD	September 2008	001	00610	Nitrogen, Ammonia (NH3	7D Qty	8.5	10.4479	9/1/2008
4PB00017*LD	January 2009	001	00530	Total Suspended Solids	30D Conc	6.0	6.03077	1/1/2009
4PB00017*LD	February 2009	001	00530	Total Suspended Solids	30D Conc	6.0	20.3333	2/1/2009
4PB00017*LD	February 2009	001	00530	Total Suspended Solids	7D Conc	9.0	52.7333	2/1/2009
4PB00017*LD	February 2009	001	00530	Total Suspended Solids	30D Qty	36.3	111.817	2/1/2009
4PB00017*LD	February 2009	001	00530	Total Suspended Solids	7D Qty	54.6	224.598	2/1/2009
4PB00017*LD	February 2009	001	00530	Total Suspended Solids	7D Conc	9.0	22.3333	2/8/2009
4PB00017*LD	February 2009	001	00530	Total Suspended Solids	7D Qty	54.6	193.787	2/8/2009

Attachment "B"

SPECIFIC OXYGEN UPTAKE RATE DATA SHEET, SLUDGE FOR LAND APPLICATION

DATE:_____ TIME:_____ LOCATION:_____

SPECIFIC
OXYGEN
UPTAKE
RATE

MINUTES	TEMPERATURE Celsius	DISSOLVED OXYGEN mg/L
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
OXYGEN CONSUMPTION (mg/L) =		/15 =
OXYGEN CONSUMPTION RATE (mg/L)/(mintue) =		

SLUDGE DATA - TOTAL SOLIDS (TS)

SAMPLE VOLUME (mL) =

A = WEIGHT OF DISH + DRIED RESIDUE (mg) =

B = WEIGHT OF DISH (mg)=

C = WEIGHT OF DRIED RESIDUE (mg) =

mg/L TS = (C x 1000) / (SAMPLE VOLUME, mL) =

SOUR CALCULATION

SOUR (mg/g)/h = Oxygen Consumption Rate (mg/L) / minute x 60 minutes / hour x 1000 mg/g / TS (mg/L) x diluted volume / original volume

TEMPERATURE CORRECTION

SOUR@20C = SOUR x Q^(20-T) WHERE T=ACTUAL TEMP OF SLUDGE, OVER 20C Q=1.05, UNDER 20C Q=1.07

SOUR (mg/g)/hour = _____ **OEPA REQUIRES SOUR ≤ 1.5 (mg/g)/hour**

Specific Oxygen Uptake Rate (SOUR)

Reference:

Standard Methods; 2710 A, 2710 B

Scope and Application

The Specific Oxygen Uptake Rate (SOUR), also known as the oxygen consumption or respiration rate, is defined as the milligram of oxygen consumed per gram of volatile suspended solids (VSS) per hour. This quick test has many advantages; rapid measure of influent organic load and biodegradability, indication of the presence of toxic or inhibitory wastes, degree of stability and condition of a sample, and calculation of oxygen demand rates at various points in the aeration basin.

This test was originally developed as a plant control parameter. SOUR is now also used as an alternative test method to meet the vector attraction reduction requirement imposed by 40 CFR Part 503 standards for the use or disposal of sewage sludge. This requirement reduces the potential of spreading infectious disease agents by vectors (e.g. insects, rodents, and birds). SOUR - 503 is defined as milligram of oxygen consumed per gram of total solids (TS) per hour.

Apparatus

- **Oxygen consumption rate device, either:**
- **Probe with an oxygen-sensitive electrode and meter OR**
- **Manometric or respirometric device with appropriate readout and sample capacity of at least 300 mL. The device should have an oxygen supply capacity greater than the oxygen-consumption rate of the sample to be measured, or at least 150 mg/L-h.**
- **Stopwatch or other suitable timing device.**
- **Thermometer to read to ± 0.5° C.**
- **Aeration device such as an aquarium pump (503 testing).**
- **300 mL BOD bottle**
- **Magnetic stirplate and stirbar.**

Reagents

The same reagents used to perform the Dissolved Oxygen test may be needed to calibrate the oxygen monitoring apparatus.

Storage / Preservation

The samples collected for SOUR testing should be analyzed as soon as possible. Realizing that the test will probably not be performed in the field and that some time will be required to transport the sample to the laboratory, delays will cause the value obtained to be lower than the actual value. If conditions cause the testing to be delayed, it may be better to obtain a new sample that can be analyzed without delay.

Raw Data Sheet Format

The following must be recorded on the data sheet:

- **Sample identification (source, name, and date of collection)**
- **Analyst**
- **Raw data**
- **Final temperature corrected results with correct units**

Quality Control

When performing replicate determinations, keep analysis temperature constant for best precision

Procedure

Calibration of Oxygen Reading Apparatus

1. **Calibrate the oxygen electrode and meter according to the manufacturer's calibration procedure. Generally, calibrate membrane electrodes using water saturated air or samples of known DO concentration (as determined by Winkler method).**

   OR

2. **Calibrate the manometric or respirometric device according to manufacturer's instructions.**

Preparation of the Sample

- **Plant Parameter Testing**

Collect enough sample to both fill a 300 ml BOD bottle and run a VSS test. Leave a minimum of one-inch headspace in the sample collection bottle. Shake sample to incorporate oxygen into the sample. Begin SOUR test immediately after collection of the sample.

- **503 Testing**

Quickly make a composite of several grab samples, collecting enough sample to both fill a 300 ml BOD bottle and run a TS test. Leave a minimum of one-inch headspace in the sample collection bottle. Shake sample to incorporate oxygen into the sample or bubble air or oxygen through sample. Begin SOUR test immediately after the collection of the sample.

Measure the SOUR of the sludge at the temperature at which the aerobic digestion is occurring in the treatment works. If a magnetic stirplate is used, it must not change the temperature of the sample during the test. Insulated stirplates are available. If this type is not on hand, insulate the stirplate top with a piece of Styrofoam or other insulating material.

Measurement of Oxygen Consumption Rate

- **Plant Parameter and 503 Testing**

1. **Fill sample container to overflowing with a representative sample.**
2. **Begin monitoring of the dissolved oxygen.**
   a. **If an oxygen sensing electrode is used, immediately insert it into the BOD bottle containing a magnetic stirring device and sample. Displace enough sample with the probe containing the electrode to fill the flared top of the BOD bottle in order to isolate its contents from the atmosphere. Stir sample. Adequate mixing is essential!**
   b. **If a manometric or respirometric device is used, follow the manufacturer's instructions for startup.**
3. **After the meter reading has stabilized, record initial DO or manometric or respirometric reading, and start timing device. Record appropriate DO, manometric or respirometric data at least once per minute, depending on rate of consumption.**

4. **Record data over a 15 minute period or until DO levels drop below 1 mg/L, whichever occurs first. (The oxygen electrode may not be accurate at DO levels below 1 mg/L.)**
5. **Low DO (<2.00 mg/L at the start of the test) may limit oxygen uptake by the sample. This phenomenon will be indicated by a decreasing rate of oxygen consumption as the test progresses. Reject such data as being unrepresentative of oxygen-consumption rate and repeat the test beginning with a sample having a higher initial DO level.**

Calculations

If an oxygen electrode is used, plot observed readings (mg/L DO) versus time (minutes) on graph paper and determine the slope of the line of best fit. The slope is the oxygen consumption rate in milligrams per liter per minute.

If a manometric or respirometric device is used, refer to manufacturer's instructions for calculating the oxygen consumption rate.

Calculate specific oxygen rate in milligrams per liter per gram per hour as follows:

Parameter Testing

$$\text{SOUR (mg/g)/h} = \frac{\text{oxygen consumption rate (mg/L)}}{\text{minute}} \times \frac{60\text{ minutes}}{\text{hour}} \times \frac{1000\,{}^{\text{mg}}/_{\text{g}}}{\text{VSS}\,{}^{\text{mg}}/_{\text{L}}}$$

- **Example**

A sample is collected for parameter testing at a treatment plant. The oxygen level of the sample is monitored at 30-second intervals. After 10 minutes, the dissolved oxygen level was below 1.00 mg/L. The oxygen depletion of each reading averaged 0.40 mg/L. The volatile suspended solids was analyzed and reported as 3500 mg/L. What is the SOUR?

First, note that the dissolved oxygen level was recorded every 30 seconds, therefore the average needs to be multiplied by 2 to get the oxygen consumption rate in the proper units.

$$\text{SOUR (mg/g)/h} = \frac{\text{oxygen consumption rate (mg/L)}}{\text{minute}} \times \frac{60\text{ minutes}}{\text{hour}} \times \frac{1000\,{}^{\text{mg}}/_{\text{g}}}{\text{VSS}\,{}^{\text{mg}}/_{\text{L}}}$$

$$\text{SOUR (mg/g)/h} = \frac{0.80\text{ (mg/L)}}{\text{minute}} \times \frac{60\text{ minutes}}{\text{hour}} \times \frac{1000\,{}^{\text{mg}}/_{\text{g}}}{3500\text{ VSS}\,{}^{\text{mg}}/_{\text{L}}}$$

$$\text{SOUR (mg/g)/h} = 13.71 \text{ or } 14$$

The most useful SOUR values will be determined by individual treatment plants for their own use, however, the following may be a helpful guideline:

>20	**High**	**This may indicate that there are not enough solids for the**

		BOD loading.
12 – 20	**Normal**	**This range will usually produce a good BOD removal and a sludge that settles well in the final clarifier.**
<12	**Low**	**This may indicate that there are too many solids or there has been a toxic occurrence.**

503 Testing

$$\text{SOUR (mg/g)/h} = \frac{\text{oxygen consumption rate (mg/L)}}{\text{minute}} \times \frac{60\text{ minutes}}{\text{hour}} \times \frac{1000\,{}^{\text{mg}}/_{\text{g}}}{\text{TS}\,{}^{\text{mg}}/_{\text{L}}} \times \frac{\text{diluted volume}}{\text{original volume}}$$

Notice that total solids are used rather than volatile solids. This is consistent with the 503 regulations. The rational for this is because all the sludge solids may degrade and exert an oxygen demand, not just the volatile portion.

It may be necessary to make dilutions of the sample in order to get a linear slope for the oxygen consumption rate. Use distilled water to make any necessary dilutions to ensure that no organic material is added in the dilution process. Use the undiluted sample to determine total solids and back calculate to correct if a dilution was used for oxygen consumption testing.

- **Example**

A sample is collected for 503 testing at a treatment facility. The sample is collected from an anaerobic digester. Due to the low oxygen levels, 500 mL of the sample is diluted to 1 L using distilled water. The oxygen level of the sample is monitored at 15-second intervals. After 14 minutes, the dissolved oxygen level was below 1.00 mg/L. The oxygen depletion of each reading averaged 0.12 mg/L. The total solids was analyzed and reported as 4.8 %. What is the SOUR?

$$\text{SOUR (mg/g)/h} = \frac{\text{oxygen consumption rate (mg/L)}}{\text{minute}} \times \frac{60\text{ minutes}}{\text{hour}} \times \frac{1000\,{}^{\text{mg}}/_{\text{g}}}{\text{TS}\,{}^{\text{mg}}/_{\text{L}}} \times \frac{\text{diluted volume}}{\text{original volume}}$$

$$\text{SOUR (mg/g)/h} = \frac{0.48\text{ (mg/L)}}{\text{minute}} \times \frac{60\text{ minutes}}{\text{hour}} \times \frac{1000\,{}^{\text{mg}}/_{\text{g}}}{48000\,{}^{\text{mg}}/_{\text{L}}} \times \frac{1000\text{ mL}}{500\text{ mL}}$$

$$\text{SOUR (mg/g)/h} = 1.2$$

Temperature Correction

In order to meet the SOUR criteria for 40 CFR 503, the SOUR must be less than or equal to

1.5 (mg/g)/hour of total solids (dry weight) at 20° C. This level is used to discriminate between adequately stabilized and poorly stabilized sludge.

The SOUR of the sludge must be measured at the temperature at which the aerobic digestion is occurring and corrected to 20° C by the following equation:

$$SOUR_{20} = SOUR_T \times Q^{(20-T)}$$

Where Q is a temperature dependent variable:

Q = 1.05 above 20° C

Q = 1.07 below 20° C

This correction may be applied only if the temperature of the sludge is between 10° C and 30° C

- **Example**

If the digested sludge used in the above example was

14°C, then :

$SOUR_{20} = 1.2 \times 1.07^{(20-14)}$

$SOUR_{20} = 1.2 \times 1.07^{(6)}$

$SOUR_{20} = 1.2 \times 1.50$

$SOUR_{20} = 1.8$

23°C, then :

$SOUR_{20} = 1.2 \times 1.05^{(20-23)}$

$SOUR_{20} = 1.2 \times 1.05^{(-3)} \; or \; 1.2 \times \frac{1}{1.05^3}$

$SOUR_{20} = 1.2 \times 0.864$

$SOUR_{20} = 1.04 \; or \; 1.0$

SOUR Analysis; the Tips for Techs version

- **Prepare raw data sheet**
- **Calibrate the apparatus that will be used to measure the dissolved oxygen**
- **Collect sample**
- **Place the sample into the sample test vessel**
- **Read and record dissolved oxygen levels in the sample at fixed time intervals**
- **Perform the appropriate solids analysis on the undiluted sample**
- **Calculate results, adjust for temperature if necessary**