Generator Name: ALEXANDRIA STP	Current NPDES No: TN0021539	Existing Tracking No:

	Owner or Operator: (the person or legal entity which controls the site's operation)			
1	Official Contact Person Name: (individual responsible for a site) RICH POTTER	Title or Position: Certified OPERATOR		
	Mailing Address: 102 High Street	City: ALEXANDRIA	State: TN	Zip: 37
	Phone: (615) 683-5721	E-mail: smithwaterplant@dtccom.net		
2	Local Contact Person Name: (if appropriate, write "same as #1") SAME AS # 1	Title or Position:		
	Site Address: (this may or may not be the same as street address)	Site City:	State: TN	Zip: 37012
	Phone: ( )	E-mail:		

Write in the box (to the right) or circle the number (above) to indicate where to send correspondence:

A. OPERATIONAL INFORMATION:

Estimated annual amount of biosolids generated (dry weight basis) 10 metric tons (tons)

Estimated annual amount of biosolids to be land applied (dry weight basis) _____ (tons)

B. BIOSOLIDS TREATMENT PROCESS: Please provide a description of the biosolids treatment process used prior to biosolids being land applied (use a separate sheet, if necessary): WASTE ACTIVATED SLUDGE IS PUMPED FROM THE AERATION BASINS TO THE SLUDGE DIGESTER WHERE IT IS AERATED AND DEWATERED. IT IS HELD LONG ENOUGH TO ACHIEVE REQUIRED PATHOGEN REDUCTION & VECTOR ATTRACTION REDUCTION PERMIT LEVELS

C. CHEMICAL ANALYSIS: Indicate which contaminant standard(s) the biosolids meet:

Table 1 Ceiling Contaminant Concentrations: ☐ **Table 3 Contaminant Concentrations:** ☒

- Submit analytical results to demonstrate eligibility for and compliance with the quality criteria specified in the General Permit.
- Submit analytical results for PCBs and TCLP that are less five years old.

D. PATHOGEN REDUCTION LEVEL ACHIEVED: Indicate alternative used to achieve the pathogen reduction. For Class A, Alternatives 5 and 6; for Class B, Alternatives 2 and 3, list the specific Process to Further Reduce Pathogens (PFRP) or Process to Significantly Reduce Pathogens (PSRP).

Class A: ☐ **Alternative 1** ☐ **Alternative 2** ☐ **Alternative 3**
☐ **Alternative 4** ☐ **Alternative 5** _____ ☐ **Alternative 6** _____
(List PFRP) **(List Eq. PFRP)**

Class B: ■ **Alternative 1** ☐ **Alternative 2** _____ ☐ **Alternative 3** _____
(List PSRP) **(List Eq. PSRP)**

Provide a detailed description of the pathogen treatment process. Attach laboratory analytical and/or process monitoring results, as appropriate, that demonstrate pathogen reduction is being achieved:

Appendix A – Notice of Intent (NOI)

(next page)

E. VECTOR ATTRACTION REDUCTION LEVEL ACHIEVED: Indicate the option used to achieve the vector attraction reduction.

☐ **Option 1** ☐ **Option 2** ☐ **Option 3** ■ **Option 4**
☐ **Option 5** ☐ **Option 6** ☐ **Option 7** ☐ **Option 8**

If one of the vector attraction reduction Options 1 - 5 is selected, do the biosolids meet Class A pathogen reduction requirements prior to or at the same time as meeting the vector attraction reduction requirements?

☐ **Yes** ■ **No**

Provide a detailed description of the vector attraction reduction treatment process. Attach laboratory analytical and/or process monitoring results, as appropriate, that demonstrate vector attraction reduction is being achieved:

F. If one of the vector attraction reduction Options 1 - 8 above was not performed, indicate how the vector attraction reduction will be performed on the field as part of the land application process:

☐ **Option 9 (Subsurface Injection)** ☐ **Option 10 (Incorporation)**

G. SAMPLING PLAN: Include a detailed copy of the biosolids sampling plan as specified in the instructions. The sampling plan must address sampling protocols for contaminants, pathogen reduction, and vector attraction reduction quality criteria.

SEE Attached

H. LAND APPLICATION AREA(s): Include a list of land application area(s) that will be used for disposal of biosolids. Attach a detailed map showing appropriate buffers in accordance with section 3.2.1. (add additional pages if necessary).

Area Number	Area (acres)	Application Rate (tons/acre) per section 3.2.2.	Latitude (decimal)	Longitude (decimal)
1		5 metric tons	36.289980	-86.025332
2		5 metric tons	36.293623	-86.002278

I. CERTIFICATION: I certify under penalty of law that contaminant concentrations in the biosolids, pathogen reduction, vector attraction reduction, and other quality criteria of the biosolids stated in the regulations have been met or, if appropriate, will be met prior to land application of biosolids. I further certify that other information in this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my own knowledge as well as the inquiry of the person(s) who manage the system, or those directly responsible for gathering the information, the information submitted, to the best of my knowledge and belief, is true, accurate and complete. I further acknowledge that the facility or generator of biosolids described above is eligible for coverage under TDEC's General Permit for the Land Application of Biosolids. I am aware that there are significant penalties for submitting false information, including possibility of fines and imprisonment for knowing violations.

Name: RICH POTTER **Title:** Certified Operator

Signature:

Telephone: (615) 683- 5721 **Date Signed:** 05/30/2021

NOTE: In evaluating NOI forms, TDEC may request additional information to complete its review to determine the eligibility for coverage under TDEC's General Permit.

Appendix B: Processes To Significantly Reduce Pathogens (PSRP)

1. Aerobic digestion—Sewage sludge or biosolids are agitated with air or oxygen to maintain aerobic conditions for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 40 days at 20 degrees Celsius and 60 days at 15 degrees Celsius.

2. Air drying—Sewage sludge or biosolids are dried on sand beds or on paved or unpaved basins. The sewage sludge or biosolids dry for a minimum of three months. During two of the three months, the ambient average daily temperature is above zero degrees Celsius.

3. Anaerobic digestion—Sewage sludge or biosolids are treated in the absence of air for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 15 days at 35 to 55 degrees Celsius and 60 days at 20 degrees Celsius.

4. Composting—Using either the within-vessel, static aerated pile, or windrow composting methods, the temperature of the sewage sludge or biosolids is raised to 40 degrees Celsius or higher and remains at 40 degrees Celsius or higher for five days. For four hours during the five days, the temperature in the compost pile exceeds 55 degrees Celsius. Passively aerated static pile composting is not an acceptable PSRP.

5. Lime stabilization—Sufficient lime is added to the sewage sludge or biosolids to raise the pH of the sewage sludge or biosolids to 12 after two hours of contact.

Appendix C: Processes to Further Reduce Pathogens (PFRP)

1. Composting—Using either the within-vessel composting method or the static aerated pile composting method, the temperature of the sewage sludge or biosolids is maintained at 55 degrees Celsius or higher for three days. Passively aerated static pile composting is not an acceptable PFRP.

   Using the windrow composting method, the temperature of the sewage sludge or biosolids is maintained at 55 degrees or higher for 15 days or longer. During the period when the compost is maintained at 55 degrees or higher, there shall be a minimum of five turnings of the windrow.

2. Heat drying—Sewage sludge or biosolids are dried by direct or indirect contact with hot gases to reduce the moisture content of the sewage sludge or biosolids to 10 percent or lower. Either the temperature of the biosolids particles exceeds 80 degrees Celsius or the wet bulb temperature of the gas in contact with the biosolids as the biosolids leaves the dryer exceeds 80 degrees Celsius.

3. Heat treatment—Liquid sewage sludge or biosolids are heated to a temperature of 180 degrees Celsius or higher for 30 minutes.

4. Thermophilic aerobic digestion—Liquid sewage sludge or biosolids are agitated with air or oxygen to maintain aerobic conditions and the mean cell residence time of the sewage sludge or biosolids is 10 days at 55 to 60 degrees Celsius.

5. Beta ray irradiation—Sewage sludge or biosolids are irradiated with beta rays from an accelerator at dosages of at least 1.0 megarad at room temperature (ca. 20 degrees Celsius).

6. Gamma ray irradiation—Sewage sludge or biosolids are irradiated with gamma rays from certain isotopes, such as ^{60} Cobalt and ^{137} Cesium, at dosages of at least 1.0 megarad at room temperature (ca. 20 °Celsius).

7. Pasteurization—The temperature of the sewage sludge or biosolids is maintained at 70 degrees Celsius or higher for 30 minutes or longer.

Appendix D: Certification Statements

Certification Statement 1

"I certify, under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirements in Part 3.1.2.1. and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in Section 3.1.3. (a) through (h)] 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."

Certification Statement 2

"I certify, under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirements in Part 3.1.2.1.1. 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."

Certification Statement 3

"I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in Section 3.2. and the vector attraction reduction requirement in [insert either Section 3.1.3. (i) or (j)] 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."

Certification Statement 4

"I certify, under penalty of law, that the information that will be used to determine compliance with the Class B pathogen requirements in Part 3.1.2.2. and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in Section 3.1.3. (a) through (h) if one of those requirements is met] 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."

Certification Statement 5

"I certify, under penalty of law, that the information that will be used to determine compliance with the management practices in Section 3.2., the site restrictions in Subsection 3.1.2.3., and the vector attraction reduction requirement in [insert either Section 3.1.3. (i) or (j) if one of those requirements is met] was prepared for each site on which bulk biosolids are applied 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."

Certification Statement 6

"I certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements in [insert either Part 3.1.2.1. or Part 3.1.2.2.] and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in Section 3.1.3. (a) through (h) if one of those requirements is met] 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."

Certification Statement 7

"I certify, under penalty of law, that the information that will be used to determine compliance with the requirement to obtain information in Subsection 3.1.1.1. was prepared for each site on which bulk biosolids were applied 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."

Certification Statement 8

"I certify, under penalty of law that the information that will be used to determine compliance with the management practices in Section 3.2. was prepared for each site on which bulk biosolids were applied 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."

Certification Statement 9

"I certify, under penalty of law, that the information that will be used to determine compliance with the site restrictions in Subsection 3.1.2.3. for each site on which Class B biosolids were applied 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."

Certification Statement 10

"I certify, under penalty of law, that the information that will be used to determine compliance with the vector attraction reduction requirement in [insert either Section 3.1.3. (i) or (j)] 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."

Certification Statement 11

"I certify, under penalty of law, that the information that will be used to determine compliance with the management practice in Section 3.2., the Class A pathogen requirement in Part 3.1.2.1., and the vector attraction reduction requirement in [insert one of the vector attraction reduction requirements in Section 3.1.3. (a) through (h)] 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."

Appendix E: Example of Agronomic Rate Calculation

Determine how many tons per acre of aerobically digested biosolids can be applied as dewatered cake to a hayfield (Tall Fescue) expected to yield 3 tons per acre in 2 cuttings, based upon following biosolids analysis:

Biosolids Analysis	DRY WT	Units
Total Kjeldahl Nitrogen (TKN)	47,000	mg/kg
Ammonium nitrogen, (NH_4-H)	<650	mg/kg
Nitrate plus Nitrite Nitrogen, (NO_3-N + NO_2-N)	22,000	mg/kg

Crop Type Tall Fescue Hay **(See Table 4)** 120 lb N/acre/year

To convert milligram per kilogram to pounds per ton multiply by 0.002.

		Calculated	Units
1. Available nitrogen from biosolids			
a. Total Kjeldahl Nitrogen (TKN) (TKN(mg/kg) x 0.002)	47,000 x 0.002 =	94	lbs/ton
b. Ammonium nitrogen (NH_4-N) (NH_4-N (mg/kg) x 0.002)	<650 x 0.002 =	<1.3	lbs/ton
c. Nitrate plus Nitrite nitrogen (NO_3-N + NO_2-N) (NO_3-N + NO_2-N mg/kg x 0.002)	22,000 x 0.002 =	44	lbs/ton
d. Total available inorganic nitrogen. (1b x Kv) plus 1c)	(<1.3 x 0.5) + 44 =	45	lbs/ton
Obtain Kv from Table 5	0.5		
e. Organic nitrogen in biosolids. (Subtract 1b from 1a.)	94 - 1.3 =	93	lbs/ton
f. Available organic nitrogen for the first year of application (Multiply 1e by Fm for anaerobic or aerobic process.)	93 x 0.3 =	28	lbs/ton
Obtain F_m from Table 6	0.3		
g. Total nitrogen available from biosolids. (Add 1d and 1f)	45 + 28 =	73	lbs/ton
2. Available nitrogen in the soil		10	lbs/acre
a. Soil test results of background nitrogen in soil		Default - Experience	
b. Or, Estimate of available nitrogen from previous biosolids applications (If estimate, attach explanation of how estimated.)			
3. Nitrogen supplied from other sources.			
a. Nitrogen from supplemental fertilizers (if appropriate)		0	lbs/acre
b. Nitrogen from irrigation water. (if appropriate)		0	lbs/acre
c. Nitrogen from previous crop. (Unless #2 is based in soil testing.)		0	lbs/acre

d. Other (If appropriate) (specify)		0	lbs/acre
e. Total Nitrogen from other sources: add a,b,c, and d if available		0	lbs/acre
4. Total nitrogen available from existing sources Add 2 and 3e		10	lbs/acre
5. Total nitrogen requirement of crop. Obtain information from Table 4 or agricultural extension agents or other agronomy professional		120	lbs/acre
6. Supplemental nitrogen needed from biosolids. (Subtract 4 from 5)	120 - 10 =	110	lbs/acre
7. Agronomic loading rate (Divide 6 by 1g)	110 / 73 =	1.5	tons/acre

Notice of Determination SOP: TNB000000

This notice summarizes the Division of Water Resources' (division) consideration of public comments received on a proposed permit reissuance. This notice also announces the division's final permit determinations. The division has determined to issue Standard Operating Permit Number TNB000000 authorizing the land application of non-exceptional quality biosolids in the State of Tennessee.

Introduction

The division appreciates everyone's participation in the public hearing as well as each public comment received. Public participation helps ensure that local factors relevant to water quality protection have been considered in the regulatory permitting process. This Notice of Determination responds to comments received through public participation in 1 public notice and 1 public hearing whose chronology is summarized below. All comments received during either comment period have been considered in the final determination.

Summary of Public Participation Opportunities

The division solicited comments March 26, 2018 on its intent to issue SOP Permit # TNB000000. This draft permit was also the subject of a public hearing conducted April 17, 2019. Public comments could be submitted electronically, in written format, or verbally at the public hearing. Comments were accepted through May 1, 2019.

Comments and Responses

The following comments have been edited and summarized from their original form to organize the presentation of content. It has not been the division's intent to omit or alter content.

1. Under Appendix A there is no longer a space to include latitude/longitude for new farms/fields. How is this information to be submitted under the new permit?

Response: Appendix A displays an example of the Notice of Intent form, it is not the official CN-1441 form required for coverage of new sites. The appendix will be changed to reflect the actual formatting of the Notice of Intent form.

2. The certification statement for Class B site restrictions was removed from 3.1.2.3 and was not added to the new location in the permit (Appendix D).

Response: It is now included, along with the other relevant certification statements, in Appendix D.

3. Request that Section 3.1.2.3 (e) be more clearly defined to state during no time while staging/storage/hauling/applying biosolids, animals shall not be allowed to graze and shall not be allowed to graze for 30 days post completion.

   Response: Animals shall at no time during the staging, storing, hauling, or application of biosolids be allowed to graze on the land. Following the completion of land application, animals shall not be allowed to graze for an additional 30 days.

4. Request Table 4, "Nitrogen Requirement (lbs N per Acre per Year)" be changed to "Nitrogen Requirement (lbs Available N per Acre per Year)".

   Response: The biosolids application rate calculation methodology, as shown in Appendix E, is based on University of Tennessee – Extension recommendations for crop nitrogen; and plant available nitrogen is included in the calculation.

5. Table 4 footnote 1 is unclear. How will approval of nitrogen needs for soybeans be conveyed? What is the timeframe for this? Is this per crop year or per application year? Is approval required in writing?

   Response: The permittee must demonstrate that nitrogen application amounts are based on University of Tennessee - Extension recommendations for soybean production. Applicants will receive an approval letter or email associated with an NOI package listing soybeans as the crop, in the same manner that any other crop type would be approved.

6. Under section 3.2.4 Restrictive Site Conditions, will this be determined via FEMA flood maps? If not how will it be determined?

   Response: The rules prevent application of biosolids in areas that are flooded. FEMA maps, soils information, and hydrologic plants can help determine areas that flood frequently.

7. Under section 3.3, Storage of non-EQ Biosolids Prior to Land Application, please define "long term" field storage of biosolids. "Must" is not defined. Is it elective or are there qualifications to be able to store? Suggest "staged" to be changed to "stored" as these are two separate terms.

   Response: Long term field storage of biosolids is qualified as any solids stored on sight for a period of time up to 2 years. Once the biosolids have been stored for 2 years or more the area is then considered a surface disposal site and is subject to further requirements under 40 CFR 503. The division does not recommend that biosolids be field stored more than 2 weeks prior to application because of potential water quality (groundwater) contamination. It has not been determined the extent of nutrient loss that can take place over an extended period of stockpiling

biosolids, but based on that potential it is recommended that biosolids are spread as soon as feasibly possible.

8. Request "tracking" and "spill" be clearly defined.

   Response: Tracking and spillage are common terms as referenced in the EPA Guide to Field Storage of Biosolids. While the Division strives to be reasonable, there is no basis for land application outside the approved land application areas. Best management practices to reduce or eliminate tracking and spillage can be found in the EPA Guide to Field Storage of Biosolids.

9. In regards to Section 2.2 New Land Application Sites, commenter suggests separating coverage under the GP for biosolids quality from approval of application sites. In other words, a utility may obtain coverage under the GP indicating that the biosolids quality meets the regulatory standards and, in turn, will apply separately for approval of land application sites after coverage under the GP granted by the Department.

   Commenter continues that, within the currently language of proposed revisions, there is no clear indication on how a generator submits for approval for a new land application site. Suggest updating the language to the following: Section 2.2 New Applicants Seeking Coverage Under the General Permit. Commenter also suggests to include "The generator must also provide a land application plan(s) in accordance with the requirements of Rule 0400-40-15-.06(8) for any new land application sites." In this section.

   Response: The division grants permit coverage concurrently with approval of initial land application sites. If a utility wishes to add additional sites under their permit they will have to supply relevant land application site information; but if their analytical information is up to date, will not require the same review process as applying for initial permit coverage.

   The division acknowledges the unclear language of Section 2.2 and opts to change the section to: "Section 2.2 New Land Appliers".

   The division will include "The generator must also provide a land application plan(s) in accordance with the requirements of Rule 0400-40-15-.06(8) for any new land application sites." In this section to align with the Rule.

10. In Section 3.3 Storage of Non-EQ Biosolids Prior to Land Application, The words "must be" are not well defined. Recommend substituting "are" in the place of "must be".

    Response: The division will revise the section to read "Long term field storage of biosolids prior to land application is not advisable. If non-EQ 'are' field stored, they shall be staged in a manner to prevent runoff or leachate from the designated storage area".

11. The definition of liquid biosolids in Section 3.2.4 (i.e. biosolids <17% TS) directly conflicts with the definition of liquid biosolids in the definitions section (i.e. biosolids ≤8% TS). We recommend

either removing the word "liquid" from Section 3.2.4 or changing the definition of liquid biosolids.

Response: The division will remove the word "liquid" from section 3.2.4.

12. The permit reads "the permittee shall provide the average and maximum concentrations of ammonia (as N), total Kjeldahl nitrogen (TKN), organic nitrogen, nitrates (as N)"...
The reporting requirement (indicated using "shall") should be changed so nitrate is not explicitly listed.

    -Nitrate is not a required analyte in 40 CFR 503
    -Testing for nitrate, depending on the method/matrix, returns nitrate+nitrite, which does not meet the language in the draft permit.
    -Nitrate+nitrite in biosolids is often non-detect, and reported on order of <10 mg/kg or <100 mg/kg. TKN is general about 40,0000 mg/kg. Since TKN is commonly reported with three significant figures, nitrate is negligible, usually less than the reporting resolution of TKN itself.

Response: testing for Nitrate+Nitrite is a requirement in determining the agronomic rate for land application. The formula for determining agronomic rate is based on UT Ag Extension recommendation and considers the Nitrogen needs of the crop being grown. The specifically referenced language, regarding annual reporting, will be modified to include only the analytes required and read as follows: "In the annual report, the permittee shall provide the concentrations of ammonia (as N), total Kjeldahl nitrogen (TKN), nitrate+nitrite (as N) that were used to determine the agronomic loading rate of biosolids that were land applied during the reporting year. Total solids values should also be provided".

Conclusion

For the foregoing reasons, and for the reasons set forth in the rationale for the draft SOP permit and the public notice, the division has determined, after implementing necessary changes, to issue SOP Permit # TNB000000 authorizing the land application of non-exceptional quality biosolids in the State of Tennessee.

Land Application Plan

1. Previous biosolids applications where metals exceeded Table 3.
    a. No previous applications of biosolids have been made where metals exceeded Table 3, or
    b. During the date _____ to the date_____ , _____ tons of biosolids were applied to _____acres of site _____. The concentrations of metals which exceeded Table 3 were_____. Table 2 Cumulative Loading Rate records were kept.
2. Type of Crops. Example Crops
    a. Perennial grass for hay and pasture- Typically hay is harvested in May-June and possibly later in the summer, with grazing of livestock during the remainder of the year depending upon need and rainfall
    b. Perennial grass for hay- Typically hay is harvested in May-June and later in the summer to fall depending upon rainfall
    c. Corn, grain or silage- Corn is typically planted in April, silage harvested in July-August, or grain combined in Sept-October.
    d. Soybeans- Typically planted in April-July and combined Sept- November.
    e. Wheat- Typically planted following summer harvest, may be grazed, incorporated or allowed to mature as grain.
    f. Other-
3. Agronomic loading rate. Agronomic loading rate is calculated from nitrogen testing and expected crop nitrogen usage. TDEC standard form is used. Rate calculations are for the upcoming growing season.
4. Method of application- Biosolids are applied using (include all possible options for your system) liquid spreader truck, tractor towed liquid manure equipment, tractor towed dry manure spreading equipment, truck mounted dry manure spreader.
5. Seasonal biosolids applications- Biosolids may be applied in all season of the year, depending upon weather and soil condition.
6. Biosolids are applied in Smith County.
7. On site storage- Biosolids are/are not stored at the application site.
8. See attached maps.

Biosolids Sampling Plan

Tennessee Rules and Regulations, 0400-40-15-.02 Table 1

Table 1
Frequency of Monitoring-Land Application

Amount of Biosolids [1] (metric tons per calendar year)	Frequency
Greater than 0 but less than 290	Once per year
Equal to or greater than 290 but less than 1,500	Once per quarter (4 times per year)
Equal to or greater than 1,500 but less than 15,000	Once per 60 days (6 times per year)
Equal to or greater than 15,000	Once per month (12 times per year)

[1] Either the amount of bulk biosolids applied to the land or the amount of biosolids prepared for sale or give-away in a bag or other container for application to the land (dry weight basis).

Note: 290 dry metric tons would be 7.67 MG of sludge at 1% total solids.

Containers: Preferred containers are Teflon, glass or stainless steel, plastic, steel or aluminum may be used, but galvanized coatings are to be avoided because they can release zinc into the sample. Containers are thoroughly cleaned using standard lab glassware cleaning processes.

Nine Metals and Four Nitrogens

Early in the Monitoring Period or prior to a hauling event, a sample will be collected from the digester with aeration operating fully in order to have a well-mixed digester. A clean dipper is used to collect multiple aliquots that are composited in the laboratory provided container. Aliquots are collected over at least 15 minutes while the digester is mixing.

Fecal Coliform Testing

Early in the Monitoring Period or prior to a hauling event, seven samples are collected. Each sample is collected in the laboratory provided container using sterile technique.

Fecal Coliform Testing, Follow-up

Subsequent hauling events will include a single Fecal Coliform sample prior to hauling, if necessary.

Specific Oxygen Uptake Rate (SOUR) Testing

Prior to a hauling event duplicate SOUR tests will be conducted on the fully stabilized sludge. From a thoroughly mixing digester a sample of about 1 L is collected in a clean container and analyzed immediately. The duplicate test will be analyzed using a fresh sample.

Tennessee Department of Environment and Conservation - Division of Water Pollution Control

Exhibit B - Agronomic Application Rate Calculations Based on Nitrogen (N)

Revision 05/08/14

BACKGROUND INFORMATION/QUESTIONS	FILL IN BELOW
WWTP NAME	Alexandria STP
WWTP NPDES PERMIT NUMBER	TN0021539
SITE NAME	Owens Farm 1&2
COUNTY	Smith
E.A.C.	
SITE TRACKING NUMBER	
LABORATORY NAME	Pace Analytical Labs
DATE OF ANALYSIS	7/16/20

SLUDGE/BIOSOLID ANALYSIS LABORATORY RESULTS

(Attached a copy of the laboratory analysis used for these calculations to this report)

TOTAL KJELDAHL NITROGEN (TKN)	7,370	mg/kg
AMMONIUM NITROGEN (NH_4-N)	188	mg/kg
NITRATE + NITRITE NITROGEN (NO_3-N + NO_2-N)	5,030	mg/kg
NITROGEN FROM SUPPLEMENTAL FERTILIZERS (If Appropriate)	0	lbs/acre
NITROGEN FROM IRRIGATION WATER (If Appropriate)	0	lbs/acre
NITROGEN FROM PREVIOUS CROP (Unless 2 is based on soil testing)	0	lbs/acre
OTHER (If Appropriate) Specify _____	0	lbs/acre

SELECT CROP TYPE (SELECT ONLY ONE)	YES
1 - CORN (GRAIN) EXPECT YIELD 100 - 125 BUSHELS	☐
2 - CORN (GRAIN) EXPECT YIELD 126 - 150 BUSHELS	☐
3 - CORN (SILAGE) EXPECT YIELD 20 TONS	☐
4 - SOYBEANS EXPECT YIELD 30 BUSHELS	☐
5 - SOYBEANS EXPECT YIELD 40 BUSHELS	☐
6- SOYBEANS EXPECT YIELD 50 BUSHELS	☐
7- WHEAT EXPECT YIELD 40 BUSHELS	☐
8 - SUMMER ANNUAL GRASS EXPECT YIELD 6 TONS (1 CUTTINGS)	☐
9 - HYBRID HAY EXPECT YIELD 8 TONS (4 CUTTINGS)	☐
10 - TALL FESCUE HAY EXPECT YIELD 3 TONS (2 CUTTINGS)	☑
11 - ORCHARD GRASS HAY EXPECT YIELD 4 TONS (2 CUTTINGS)	☐
12 - SORGHUM (GRAIN) EXPECT YIELD 60 BUSHELS	☐
13 - COTTON EXPECT YIELD 1 BALE / ACRE	☐
14 - COTTON EXPECT YIELD 1.5 BALE / ACRE	☐

CROP TYPE (LBS N/ACRE/YEAR)	120

VOLATILIZATION FACTORS K_V

(SELECT ONLY ONE)	YES
1 - ARE BIOSOLIDS LIQUID AND SURFACE APPLIED?	☑
2 - ARE BIOSOLIDS LIQUID AND INJECTED INTO SOIL?	☐
3 - ARE BIOSOLID DEWATERED AND APPLIED IN ANY MANNER?	☐

VOLATILIZATION FACTORS K_V = **0.5**

MINERALIZATION RATE F_M

WHAT BIOSOLID PROCESS GENERATE THE FRACTION (F_M) OF ORGANIC NITROGEN? (SELECT ONLY ONE)

	SELECT PROCESS
NONE (Unstabilized)	☐
ALKALINE STABILIZATION	☐
AEROBIC DIGESTION	☑
ANAEROBIC DIGESTION	☐
COMPOSING	☐

SELECTION CHOICE: **1 SELECTED**

MINERALIZATION RATE F_M = **0.3**

AGRONOMIC LOADING RATE

7.6 **tons/acre**

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

August 10, 2020

Alexandria Sewer Treatment Plant

Sample Delivery Group:	L1240214
Samples Received:	07/16/2020
Project Number:	sludge
Description:	

Report To: Rich Potter
Public Square
Alexandria, TN 37012

Entire Report Reviewed By: Linda Cashman

Linda Cashman
Project Manager

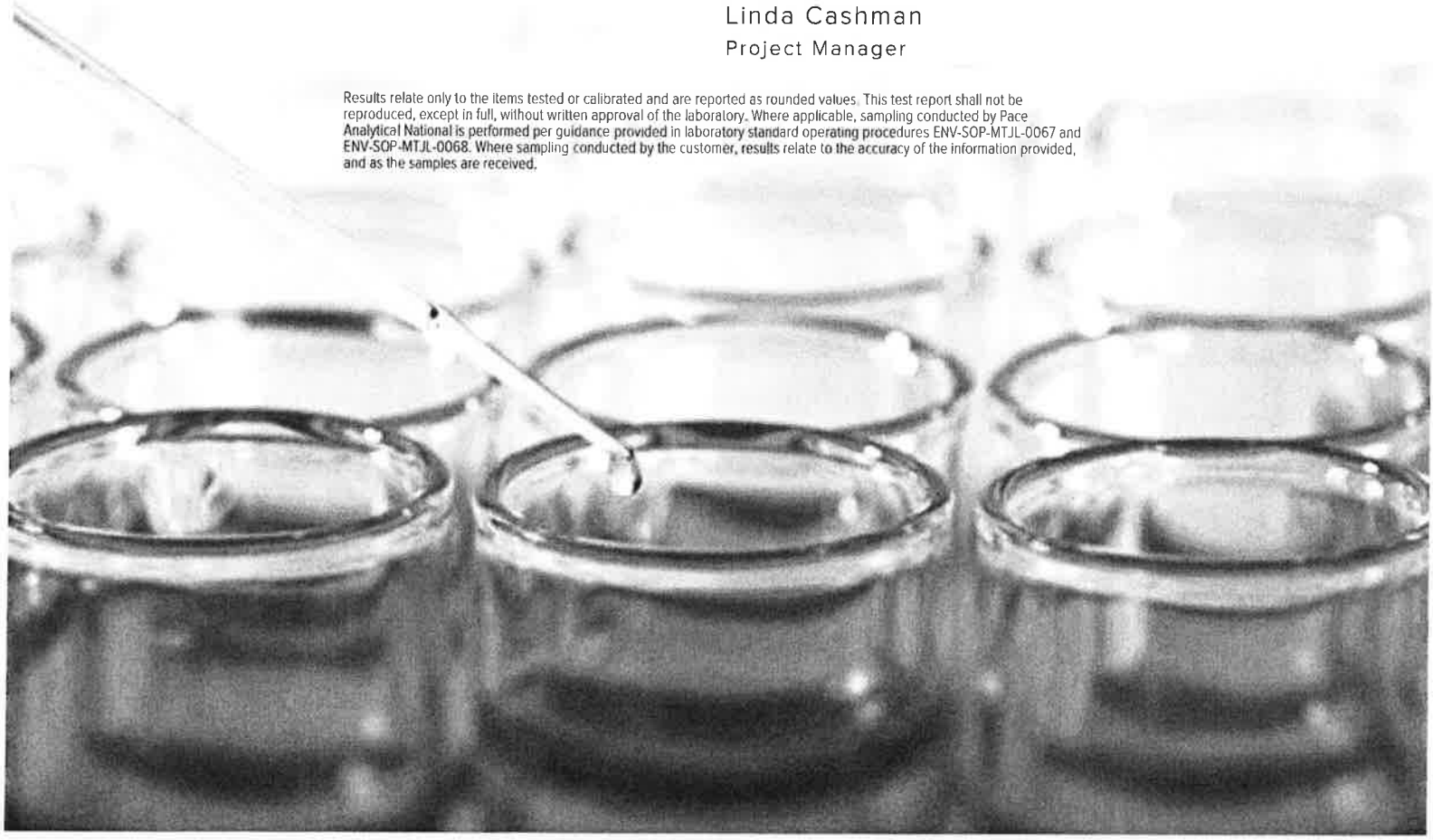

TABLE OF CONTENTS

ANNUAL SLUDGE L1240214-01 Solid

Collected by: Rich Potter | Collected date/time: 07/16/20 11:00 | Received date/time: 07/16/20 12:52

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1511168	1	07/19/20 03:27	07/19/20 03:52	TH	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1513485	1	07/22/20 17:07	07/24/20 12:57	SDL	Mt. Juliet, TN
Wet Chemistry by Method 4500NOrg C-2011	WG1512914	1	07/22/20 11:00	07/22/20 13:40	BAM	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1511817	1	07/20/20 11:53	07/20/20 18:41	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1511817	20	07/20/20 11:53	07/20/20 19:04	ELN	Mt. Juliet, TN
Mercury by Method 7471A	WG1511776	1	07/20/20 09:22	07/20/20 21:21	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1511215	1	07/20/20 05:59	07/21/20 08:17	EL	Mt. Juliet, TN
Polychlorinated Biphenyls (GC) by Method 8082	WG1511338	14.6	07/18/20 20:26	07/19/20 11:04	MTJ	Mt. Juliet, TN

ANNUAL SLUDGE L1240214-02 Waste

Collected by: Rich Potter | Collected date/time: 07/16/20 11:00 | Received date/time: 07/16/20 12:52

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG1510327	1	07/18/20 00:42	07/18/20 00:42	JGB	Mt. Juliet, TN
Preparation by Method 1311	WG1515604	1	07/26/20 20:02	07/26/20 20:02	CGD	Mt. Juliet, TN
Mercury by Method 7470A	WG1511731	1	07/20/20 05:57	07/20/20 19:22	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1511786	1	07/20/20 08:24	07/20/20 17:00	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1516074	1	07/28/20 03:36	07/28/20 03:36	ACG	Mt. Juliet, TN

ANNUAL SLUDGE L1240214-03 Solid

Collected by: Rich Potter | Collected date/time: 07/16/20 11:00 | Received date/time: 07/16/20 12:52

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Microbiology by Method EPA 1681	WG1510986	1000	07/17/20 09:34	07/17/20 09:34	JTS	Mt. Juliet, TN

ANNUAL SLUDGE L1240214-04 Waste

Collected by: Rich Potter | Collected date/time: 07/16/20 11:00 | Received date/time: 07/16/20 12:52

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Preparation by Method 1311	WG1516975	1	07/29/20 14:57	07/29/20 14:57	TDW	Mt. Juliet, TN
Chlorinated Acid Herbicides (GC) by Method 8151A	WG1517676	1	07/31/20 06:55	07/31/20 17:29	RP	Mt. Juliet, TN
Pesticides (GC) by Method 8081B	WG1518132	1	07/31/20 00:13	07/31/20 08:07	RP	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1517424	1	07/30/20 11:56	07/30/20 22:54	AO	Mt. Juliet, TN

Cp | Tc | Ss | Cn | Sr | Qc | Gl | Al | Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Linda Cashman
Project Manager

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	%				
Total Solids	5.31		1	07/19/2020 03:52	WG1511168

Wet Chemistry by Method 350.1

Analyte	Result (wet)	RDL (Wet)	Result (dry)	RDL (dry)	Qualifier	Dilution	Analysis date / time	Batch
	mg/kg	mg/kg	mg/kg	mg/kg				
Ammonia Nitrogen	ND	10.0	ND	188		1	07/24/2020 12:57	WG1513485

Wet Chemistry by Method 4500NOrg C-2011

Analyte	Result (wet)	RDL (Wet)	Result (dry)	RDL (dry)	Qualifier	Dilution	Analysis date / time	Batch
	mg/kg	mg/kg	mg/kg	mg/kg				
Kjeldahl Nitrogen, TKN	391	20.0	7370	377		1	07/22/2020 13:40	WG1512914

Wet Chemistry by Method 9056A

Analyte	Result (wet)	RDL (Wet)	Result (dry)	RDL (dry)	Qualifier	Dilution	Analysis date / time	Batch
	mg/kg	mg/kg	mg/kg	mg/kg				
Nitrate	267	200	5030	3770		20	07/20/2020 19:04	WG1511817
Nitrite	ND	10.0	ND	188		1	07/20/2020 18:41	WG1511817

Mercury by Method 7471A

Analyte	Result (wet)	RDL (Wet)	Result (dry)	RDL (dry)	Qualifier	Dilution	Analysis date / time	Batch
	mg/kg	mg/kg	mg/kg	mg/kg				
Mercury	0.222	0.0400	4.18	0.753		1	07/20/2020 21:21	WG1511776

Metals (ICP) by Method 6010B

Analyte	Result (wet)	RDL (Wet)	Result (dry)	RDL (dry)	Qualifier	Dilution	Analysis date / time	Batch
	mg/kg	mg/kg	mg/kg	mg/kg				
Arsenic	ND	2.00	ND	37.7		1	07/21/2020 08:17	WG1511215
Cadmium	ND	0.500	ND	9.42		1	07/21/2020 08:17	WG1511215
Copper	26.8	2.00	506	37.7		1	07/21/2020 08:17	WG1511215
Lead	2.08	0.500	39.2	9.42		1	07/21/2020 08:17	WG1511215
Molybdenum	ND	0.500	ND	9.42		1	07/21/2020 08:17	WG1511215
Nickel	ND	2.00	ND	37.7		1	07/21/2020 08:17	WG1511215
Selenium	ND	2.00	ND	37.7		1	07/21/2020 08:17	WG1511215
Silver	ND	1.00	ND	18.8		1	07/21/2020 08:17	WG1511215
Zinc	92.9	5.00	1750	94.2		1	07/21/2020 08:17	WG1511215

Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result (wet)	RDL (Wet)	Result (dry)	RDL (dry)	Qualifier	Dilution	Analysis date / time	Batch
	mg/kg	mg/kg	mg/kg	mg/kg				
PCB 1016	ND	0.496	ND	9.34		14.6	07/19/2020 11:04	WG1511338
PCB 1221	ND	0.496	ND	9.34		14.6	07/19/2020 11:04	WG1511338
PCB 1232	ND	0.496	ND	9.34		14.6	07/19/2020 11:04	WG1511338
PCB 1242	ND	0.496	ND	9.34		14.6	07/19/2020 11:04	WG1511338
PCB 1248	ND	0.248	ND	4.67		14.6	07/19/2020 11:04	WG1511338
PCB 1254	ND	0.248	ND	4.67		14.6	07/19/2020 11:04	WG1511338
PCB 1260	ND	0.248	ND	4.67		14.6	07/19/2020 11:04	WG1511338
(S) Decachlorobiphenyl	*80.7*			*10.0-135*			*07/19/2020 11:04*	WG1511338
(S) Tetrachloro-m-xylene	*89.7*			*10.0-139*			*07/19/2020 11:04*	WG1511338

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		7/18/2020 12:42:52 AM	WG1510327
TCLP ZHE Extraction	-		7/26/2020 8:02:54 PM	WG1515604
Fluid	1		7/18/2020 12:42:52 AM	WG1510327
Initial pH	7.46		7/18/2020 12:42:52 AM	WG1510327
Final pH	5.03		7/18/2020 12:42:52 AM	WG1510327

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	07/20/2020 19:22	WG1511731

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	07/20/2020 17:00	WG1511786
Barium	0.229		0.100	100	1	07/20/2020 17:00	WG1511786
Cadmium	ND		0.100	1	1	07/20/2020 17:00	WG1511786
Chromium	ND		0.100	5	1	07/20/2020 17:00	WG1511786
Lead	ND		0.100	5	1	07/20/2020 17:00	WG1511786
Selenium	ND		0.100	1	1	07/20/2020 17:00	WG1511786
Silver	ND		0.100	5	1	07/20/2020 17:00	WG1511786

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	07/28/2020 03:36	WG1516074
Carbon tetrachloride	ND		0.0500	0.50	1	07/28/2020 03:36	WG1516074
Chlorobenzene	ND		0.0500	100	1	07/28/2020 03:36	WG1516074
Chloroform	ND		0.250	6	1	07/28/2020 03:36	WG1516074
1,2-Dichloroethane	ND		0.0500	0.50	1	07/28/2020 03:36	WG1516074
1,1-Dichloroethene	ND		0.0500	0.70	1	07/28/2020 03:36	WG1516074
2-Butanone (MEK)	ND		0.500	200	1	07/28/2020 03:36	WG1516074
Tetrachloroethene	ND		0.0500	0.70	1	07/28/2020 03:36	WG1516074
Trichloroethene	ND		0.0500	0.50	1	07/28/2020 03:36	WG1516074
Vinyl chloride	ND		0.0500	0.20	1	07/28/2020 03:36	WG1516074
(S) Toluene-d8	*103*		*80.0-120*			*07/28/2020 03:36*	WG1516074
(S) 4-Bromofluorobenzene	*112*		*77.0-126*			*07/28/2020 03:36*	WG1516074
(S) 1,2-Dichloroethane-d4	*103*		*70.0-130*			*07/28/2020 03:36*	WG1516074

Microbiology by Method EPA 1681

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
	MPN/g				
Fecal Coliform -Geom.Mean	<3281.2		1000	07/17/2020 09:34	WG1510986
Fecal Coliform -1	<3279.6		1000	07/17/2020 09:34	WG1510986
Fecal Coliform -2	<3276.3		1000	07/17/2020 09:34	WG1510986
Fecal Coliform -3	<3336.4		1000	07/17/2020 09:34	WG1510986
Fecal Coliform -4	<3263.3		1000	07/17/2020 09:34	WG1510986
Fecal Coliform -5	<3263.8		1000	07/17/2020 09:34	WG1510986
Fecal Coliform -6	<3281.9		1000	07/17/2020 09:34	WG1510986
Fecal Coliform -7	<3268.0		1000	07/17/2020 09:34	WG1510986

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		7/29/2020 2:57:41 PM	WG1516975
Fluid	1		7/29/2020 2:57:41 PM	WG1516975
Initial pH	7.26		7/29/2020 2:57:41 PM	WG1516975
Final pH	5.05		7/29/2020 2:57:41 PM	WG1516975

Chlorinated Acid Herbicides (GC) by Method 8151A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
2,4,5-TP (Silvex)	ND		0.00200	1	1	07/31/2020 17:29	WG1517676
2,4-D	ND		0.00200	10	1	07/31/2020 17:29	WG1517676
(S) 2,4-Dichlorophenyl Acetic Acid	*83.2*		*14.0-158*			*07/31/2020 17:29*	WG1517676

Pesticides (GC) by Method 8081B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Chlordane	ND		0.00500	0.03	1	07/31/2020 08:07	WG1518132
Endrin	ND		0.00500	0.02	1	07/31/2020 08:07	WG1518132
Heptachlor	ND		0.00500	0.0080	1	07/31/2020 08:07	WG1518132
Lindane	ND		0.00500	0.40	1	07/31/2020 08:07	WG1518132
Methoxychlor	ND		0.00500	10	1	07/31/2020 08:07	WG1518132
Toxaphene	ND		0.0100	0.50	1	07/31/2020 08:07	WG1518132
(S) Decachlorobiphenyl	*83.2*		*10.0-128*			*07/31/2020 08:07*	WG1518132
(S) Tetrachloro-m-xylene	*76.5*		*10.0-127*			*07/31/2020 08:07*	WG1518132

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND	J3	0.100	7.50	1	07/30/2020 22:54	WG1517424
2,4-Dinitrotoluene	ND		0.100	0.13	1	07/30/2020 22:54	WG1517424
Hexachlorobenzene	ND		0.100	0.13	1	07/30/2020 22:54	WG1517424
Hexachloro-1,3-butadiene	ND	J3	0.100	0.50	1	07/30/2020 22:54	WG1517424
Hexachloroethane	ND	J3	0.100	3	1	07/30/2020 22:54	WG1517424
Nitrobenzene	ND	J3	0.100	2	1	07/30/2020 22:54	WG1517424
Pyridine	ND	J3	0.100	5	1	07/30/2020 22:54	WG1517424
3&4-Methyl Phenol	ND	J3	0.100	400	1	07/30/2020 22:54	WG1517424
2-Methylphenol	ND	J3	0.100	200	1	07/30/2020 22:54	WG1517424
Pentachlorophenol	ND		0.100	100	1	07/30/2020 22:54	WG1517424
2,4,5-Trichlorophenol	ND	J3	0.100	400	1	07/30/2020 22:54	WG1517424
2,4,6-Trichlorophenol	ND	J3	0.100	2	1	07/30/2020 22:54	WG1517424
(S) 2-Fluorophenol	*29.1*		*10.0-120*			*07/30/2020 22:54*	WG1517424
(S) Phenol-d5	*19.1*		*10.0-120*			*07/30/2020 22:54*	WG1517424
(S) Nitrobenzene-d5	*42.8*		*10.0-127*			*07/30/2020 22:54*	WG1517424
(S) 2-Fluorobiphenyl	*57.5*		*10.0-130*			*07/30/2020 22:54*	WG1517424
(S) 2,4,6-Tribromophenol	*68.0*		*10.0-155*			*07/30/2020 22:54*	WG1517424
(S) p-Terphenyl-d14	*80.3*		*10.0-128*			*07/30/2020 22:54*	WG1517424

Method Blank (MB)

(MB) R3550963-1 07/19/20 03:52

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.000			

L1239836-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1239836-01 07/19/20 03:52 • (DUP) R3550963-3 07/19/20 03:52

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	1.96	1.71	1	13.6	J3	10

Laboratory Control Sample (LCS)

(LCS) R3550963-2 07/19/20 03:52

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	49.9	99.8	85.0-115	

Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3552882-1 07/24/20 12:55

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Ammonia Nitrogen	U		7.00	10.0

L1240589-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1240589-01 07/24/20 12:59 • (DUP) R3552882-3 07/24/20 13:00

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ammonia Nitrogen	1500	1590	1	5.82		20

Laboratory Control Sample (LCS)

(LCS) R3552882-2 07/24/20 12:56

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Ammonia Nitrogen	500	499	99.7	90.0-110	

L1241997-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1241997-01 07/24/20 13:05 • (MS) R3552882-4 07/24/20 13:06 • (MSD) R3552882-5 07/24/20 13:10

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Ammonia Nitrogen	2710	624	3130	3170	92.5	93.8	1	80.0-120			1.13	20

Method Blank (MB)

(MB) R3552055-2 07/22/20 13:36

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Kjeldahl Nitrogen, TKN	U		4.48	20.0

L1240293-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1240293-06 07/22/20 13:53 • (DUP) R3552055-8 07/22/20 13:55

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Kjeldahl Nitrogen, TKN	ND	ND	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3552055-5 07/22/20 13:37

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Kjeldahl Nitrogen, TKN	476	444	93.2	75.2-121	

L1240293-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1240293-01 07/22/20 13:41 • (MS) R3552055-6 07/22/20 13:43 • (MSD) R3552055-7 07/22/20 13:44

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Kjeldahl Nitrogen, TKN	471	ND	67.2	53.9	14.3	11.5	1	90.0-110	J6	J3 J6	21.9	20

Method Blank (MB)

(MB) R3551448-1 07/20/20 12:39

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Nitrate as (N)	U		0.557	10.0
Nitrite as (N)	U		0.505	10.0

L1240208-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1240208-01 07/20/20 15:14 • (DUP) R3551448-3 07/20/20 15:37

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate as (N)	ND	ND	1	0.000		15
Nitrite as (N)	ND	ND	1	0.000		15

L1241317-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1241317-03 07/21/20 01:45 • (DUP) R3551448-6 07/21/20 02:11

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate as (N)	ND	ND	1	0.000		15
Nitrite as (N)	ND	ND	1	0.000		15

Laboratory Control Sample (LCS)

(LCS) R3551448-2 07/20/20 13:01

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Nitrate as (N)	20.0	19.1	95.7	80.0-120	
Nitrite as (N)	20.0	19.8	98.8	80.0-120	

L1240407-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1240407-01 07/20/20 19:27 • (MS) R3551448-4 07/20/20 19:50 • (MSD) R3551448-5 07/20/20 20:13

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Nitrate as (N)	50.0	ND	59.5	56.1	109	102	1	80.0-120			5.87	15
Nitrite as (N)	50.0	ND	51.8	48.8	104	97.5	1	80.0-120			6.05	15

Method Blank (MB)

(MB) R3551349-1 07/20/20 18:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.00330	0.0100

Laboratory Control Sample (LCS)

(LCS) R3551349-2 07/20/20 18:48

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.0300	0.0326	109	80.0-120	

L1240786-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1240786-02 07/20/20 18:50 • (MS) R3551349-3 07/20/20 18:52 • (MSD) R3551349-4 07/20/20 18:54

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0327	0.0324	109	108	1	75.0-125			0.938	20

Method Blank (MB)

(MB) R3551356-1 07/20/20 20:34

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3551356-2 07/20/20 20:36

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.500	0.443	88.7	80.0-120	

L1239861-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1239861-06 07/20/20 20:38 • (MS) R3551356-3 07/20/20 20:41 • (MSD) R3551356-4 07/20/20 20:43

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.531	0.0784	0.569	0.515	92.5	82.3	1	75.0-125			10.0	20

Method Blank (MB)

(MB) R3551741-1 07/21/20 07:29

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.460	2.00
Cadmium	U		0.0810	0.500
Copper	U		0.506	2.00
Lead	U		0.208	0.500
Molybdenum	U		0.200	0.500
Nickel	U		0.490	2.00
Selenium	U		0.617	2.00
Silver	U		0.228	1.00
Zinc	U		0.939	5.00

Laboratory Control Sample (LCS)

(LCS) R3551741-2 07/21/20 07:32

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	95.5	95.5	80.0-120	
Cadmium	100	96.6	96.6	80.0-120	
Copper	100	96.8	96.8	80.0-120	
Lead	100	97.2	97.2	80.0-120	
Molybdenum	100	101	101	80.0-120	
Nickel	100	98.9	98.9	80.0-120	
Selenium	100	95.7	95.7	80.0-120	
Silver	20.0	18.6	93.0	80.0-120	
Zinc	100	95.9	95.9	80.0-120	

L1240208-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1240208-05 07/21/20 07:34 • (MS) R3551741-5 07/21/20 07:42 • (MSD) R3551741-6 07/21/20 07:44

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	111	ND	107	97.7	95.1	87.0	1	75.0-125			8.78	20
Cadmium	111	ND	108	101	97.2	90.2	1	75.0-125			7.49	20
Copper	111	ND	115	106	102	94.6	1	75.0-125			7.77	20
Lead	111	1.34	112	104	99.6	92.4	1	75.0-125			7.43	20
Molybdenum	111	ND	100	92.8	89.8	83.3	1	75.0-125			7.50	20
Nickel	111	ND	116	108	103	96.1	1	75.0-125			6.84	20
Selenium	111	ND	106	97.2	95.1	87.2	1	75.0-125			8.63	20
Silver	22.3	ND	20.8	19.3	93.3	86.5	1	75.0-125			7.61	20

L1240208-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1240208-05 07/21/20 07:34 • (MS) R3551741-5 07/21/20 07:42 • (MSD) R3551741-6 07/21/20 07:44

Analyte	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Zinc	111	ND	112	102	98.3	90.1	1	75.0-125			8.58	20

Method Blank (MB)

(MB) R3551333-1 07/20/20 16:17

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	0.0488	J	0.0333	0.100
Barium	U		0.0333	0.100
Cadmium	U		0.0333	0.100
Chromium	U		0.0333	0.100
Lead	U		0.0333	0.100
Selenium	0.0640	J	0.0333	0.100
Silver	U		0.0333	0.100

Laboratory Control Sample (LCS)

(LCS) R3551333-2 07/20/20 16:19

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	10.0	9.53	95.3	80.0-120	
Barium	10.0	9.72	97.2	80.0-120	
Cadmium	10.0	9.51	95.1	80.0-120	
Chromium	10.0	9.30	93.0	80.0-120	
Lead	10.0	9.62	96.2	80.0-120	
Selenium	10.0	9.81	98.1	80.0-120	
Silver	2.00	1.78	89.1	80.0-120	

L1239973-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1239973-02 07/20/20 16:22 • (MS) R3551333-4 07/20/20 16:27 • (MSD) R3551333-5 07/20/20 16:30

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	9.80	9.53	97.3	94.7	1	75.0-125			2.71	20
Barium	10.0	0.366	10.3	10.0	99.1	96.7	1	75.0-125			2.37	20
Cadmium	10.0	ND	9.62	9.44	96.2	94.4	1	75.0-125			1.88	20
Chromium	10.0	ND	9.41	9.26	94.1	92.6	1	75.0-125			1.63	20
Lead	10.0	ND	9.76	9.56	97.6	95.6	1	75.0-125			2.14	20
Selenium	10.0	ND	9.84	9.74	98.4	97.4	1	75.0-125			0.976	20
Silver	2.00	ND	1.80	1.77	90.2	88.6	1	75.0-125			1.71	20

Method Blank (MB)

(MB) R3553780-3 07/28/20 02:54

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0167	0.0500
Carbon tetrachloride	U		0.0167	0.0500
Chlorobenzene	U		0.0167	0.0500
Chloroform	U		0.0833	0.250
1,2-Dichloroethane	U		0.0167	0.0500
1,1-Dichloroethene	U		0.0167	0.0500
2-Butanone (MEK)	U		0.167	0.500
Tetrachloroethene	U		0.0167	0.0500
Trichloroethene	U		0.0167	0.0500
Vinyl chloride	U		0.0167	0.0500
(S) Toluene-d8	*102*			*80.0-120*
(S) 4-Bromofluorobenzene	*109*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*103*			*70.0-130*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3553780-1 07/27/20 23:30 • (LCSD) R3553780-2 07/28/20 02:05

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.250	0.240	0.250	96.0	100	70.0-123			4.08	20
Carbon tetrachloride	0.250	0.285	0.304	114	122	68.0-126			6.45	20
Chlorobenzene	0.250	0.236	0.254	94.4	102	80.0-121			7.35	20
Chloroform	0.250	0.247	0.270	98.8	108	73.0-120			8.90	20
1,2-Dichloroethane	0.250	0.249	0.259	99.6	104	70.0-128			3.94	20
1,1-Dichloroethene	0.250	0.254	0.284	102	114	71.0-124			11.2	20
2-Butanone (MEK)	1.25	1.08	1.05	86.4	84.0	44.0-160			2.82	20
Tetrachloroethene	0.250	0.268	0.304	107	122	72.0-132			12.6	20
Trichloroethene	0.250	0.265	0.247	106	98.8	78.0-124			7.03	20
Vinyl chloride	0.250	0.221	0.236	88.4	94.4	67.0-131			6.56	20
(S) Toluene-d8				*103*	*102*	*80.0-120*				
(S) 4-Bromofluorobenzene				*108*	*109*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*103*	*104*	*70.0-130*				

L1240214-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1240214-02 07/28/20 03:36 • (MS) R3553780-4 07/28/20 10:04 • (MSD) R3553780-5 07/28/20 10:25

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.250	ND	0.260	0.238	104	95.2	1	17.0-158			8.84	27
Carbon tetrachloride	0.250	ND	0.315	0.283	126	113	1	23.0-159			10.7	28
Chlorobenzene	0.250	ND	0.263	0.266	105	106	1	33.0-152			1.13	27
Chloroform	0.250	ND	0.282	0.262	113	105	1	29.0-154			7.35	28
1,2-Dichloroethane	0.250	ND	0.312	0.294	125	118	1	29.0-151			5.94	27
1,1-Dichloroethene	0.250	ND	0.278	0.225	111	90.0	1	11.0-160			21.1	29
2-Butanone (MEK)	1.25	ND	1.37	1.30	110	104	1	10.0-160			5.24	32
Tetrachloroethene	0.250	ND	0.308	0.289	123	116	1	10.0-160			6.37	27
Trichloroethene	0.250	ND	0.298	0.261	119	104	1	10.0-160			13.2	25
Vinyl chloride	0.250	ND	0.230	0.198	92.0	79.2	1	10.0-160			15.0	27
(S) Toluene-d8					*101*	*102*		*80.0-120*				
(S) 4-Bromofluorobenzene					*103*	*104*		*77.0-126*				
(S) 1,2-Dichloroethane-d4					*108*	*107*		*70.0-130*				

Method Blank (MB)

(MB) R3555356-1 07/31/20 16:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
2,4-D	U		0.000667	0.00200
2,4,5-TP (Silvex)	U		0.000667	0.00200
(S) 2,4-Dichlorophenyl Acetic Acid	*85.4*			*14.0-158*

Laboratory Control Sample (LCS)

(LCS) R3555356-2 07/31/20 16:30

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
2,4-D	0.0500	0.0426	85.2	50.0-120	
2,4,5-TP (Silvex)	0.0500	0.0399	79.8	50.0-125	
(S) 2,4-Dichlorophenyl Acetic Acid			*85.0*	*14.0-158*	

L1243172-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1243172-01 07/31/20 17:44 • (MS) R3555356-3 07/31/20 17:58 • (MSD) R3555356-4 07/31/20 18:13

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
2,4-D	0.0500	ND	0.0435	0.0417	87.0	83.4	1	50.0-120			4.23	20
2,4,5-TP (Silvex)	0.0500	ND	0.0402	0.0376	80.4	75.2	1	50.0-125			6.68	20
(S) 2,4-Dichlorophenyl Acetic Acid					*84.4*	*82.2*		*14.0-158*				

Method Blank (MB)

(MB) R3555068-1 07/31/20 07:42

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Gamma BHC	U		0.00167	0.00500
Endrin	U		0.00167	0.00500
Heptachlor	U		0.00167	0.00500
Methoxychlor	U		0.00167	0.00500
Chlordane	U		0.00167	0.00500
Toxaphene	U		0.00333	0.0100
(S) Decachlorobiphenyl	*89.7*			*10.0-128*
(S) Tetrachloro-m-xylene	*77.2*			*10.0-127*

Laboratory Control Sample (LCS)

(LCS) R3555068-2 07/31/20 07:55

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Gamma BHC	0.0100	0.00938	93.8	55.0-129	
Endrin	0.0100	0.0100	100	57.0-134	
Heptachlor	0.0100	0.00880	88.0	27.0-132	
Methoxychlor	0.0100	0.00958	95.8	54.0-155	
(S) Decachlorobiphenyl			*94.9*	*10.0-128*	
(S) Tetrachloro-m-xylene			*83.6*	*10.0-127*	

L1240214-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1240214-04 07/31/20 08:07 • (MS) R3555068-3 07/31/20 08:20 • (MSD) R3555068-4 07/31/20 08:32

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Gamma BHC	0.0100	ND	0.00947	0.00895	94.7	89.5	1	14.0-141			5.65	40
Endrin	0.0100	ND	0.00974	0.00953	97.4	95.3	1	10.0-160			2.18	39
Heptachlor	0.0100	ND	0.00880	0.00779	88.0	77.9	1	16.0-136			12.2	40
Methoxychlor	0.0100	ND	0.00950	0.00949	95.0	94.9	1	10.0-160			0.105	34
(S) Decachlorobiphenyl					*56.2*	*78.5*		*10.0-128*				
(S) Tetrachloro-m-xylene					*54.2*	*81.2*		*10.0-127*				

Method Blank (MB)

(MB) R3550877-1 07/19/20 10:09

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.0118	0.0340
PCB 1221	U		0.0118	0.0340
PCB 1232	U		0.0118	0.0340
PCB 1242	U		0.0118	0.0340
PCB 1248	U		0.00738	0.0170
PCB 1254	U		0.00738	0.0170
PCB 1260	U		0.00738	0.0170
(S) Decachlorobiphenyl	*87.4*			*10.0-135*
(S) Tetrachloro-m-xylene	*92.8*			*10.0-139*

Laboratory Control Sample (LCS)

(LCS) R3550877-2 07/19/20 10:22

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
PCB 1260	0.167	0.147	88.0	37.0-145	
PCB 1016	0.167	0.156	93.4	36.0-141	
(S) Decachlorobiphenyl			*88.6*	*10.0-135*	
(S) Tetrachloro-m-xylene			*92.3*	*10.0-139*	

L1240728-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1240728-01 07/19/20 14:44 • (MS) R3550877-3 07/19/20 14:57 • (MSD) R3550877-4 07/19/20 15:11

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
PCB 1260	0.180	ND	0.150	0.208	83.2	116	1	10.0-160			32.5	38
PCB 1016	0.180	ND	0.255	0.988	142	549	1	10.0-160	P	J3 J5 P	118	37
(S) Decachlorobiphenyl					*85.4*	*101*		*10.0-135*				
(S) Tetrachloro-m-xylene					*67.6*	*78.5*		*10.0-139*				

Method Blank (MB)

(MB) R3555161-2 07/30/20 21:28

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
1,4-Dichlorobenzene	U		0.0333	0.100
2,4-Dinitrotoluene	U		0.0333	0.100
Hexachlorobenzene	U		0.0333	0.100
Hexachloro-1,3-butadiene	U		0.0333	0.100
Hexachloroethane	U		0.0333	0.100
Nitrobenzene	U		0.0333	0.100
2-Methylphenol	U		0.0333	0.100
3&4-Methyl Phenol	U		0.0333	0.100
Pentachlorophenol	U		0.0333	0.100
2,4,5-Trichlorophenol	U		0.0333	0.100
2,4,6-Trichlorophenol	U		0.0333	0.100
Pyridine	U		0.0333	0.100
(S) 2-Fluorophenol	*31.2*			*10.0-120*
(S) Phenol-d5	*18.9*			*10.0-120*
(S) Nitrobenzene-d5	*42.9*			*10.0-127*
(S) 2-Fluorobiphenyl	*55.1*			*10.0-130*
(S) 2,4,6-Tribromophenol	*61.5*			*10.0-155*
(S) p-Terphenyl-d14	*78.6*			*10.0-128*

Laboratory Control Sample (LCS)

(LCS) R3555161-1 07/30/20 21:07

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
1,4-Dichlorobenzene	0.500	0.233	46.6	18.0-120	
2,4-Dinitrotoluene	0.500	0.431	86.2	49.0-124	
Hexachlorobenzene	0.500	0.375	75.0	44.0-120	
Hexachloro-1,3-butadiene	0.500	0.232	46.4	19.0-120	
Hexachloroethane	0.500	0.224	44.8	15.0-120	
Nitrobenzene	0.500	0.245	49.0	27.0-120	
2-Methylphenol	0.500	0.234	46.8	28.0-120	
3&4-Methyl Phenol	0.500	0.258	51.6	31.0-120	
Pentachlorophenol	0.500	0.332	66.4	23.0-120	
2,4,5-Trichlorophenol	0.500	0.385	77.0	44.0-120	
2,4,6-Trichlorophenol	0.500	0.356	71.2	42.0-120	
Pyridine	0.500	0.167	33.4	10.0-120	
(S) 2-Fluorophenol			*30.6*	*10.0-120*	
(S) Phenol-d5			*20.7*	*10.0-120*	
(S) Nitrobenzene-d5			*45.2*	*10.0-127*	

Laboratory Control Sample (LCS)

(LCS) R3555161-1 07/30/20 21:07

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 2-Fluorobiphenyl			*61.0*	*10.0-130*	
(S) 2,4,6-Tribromophenol			*85.0*	*10.0-155*	
(S) p-Terphenyl-d14			*81.1*	*10.0-128*	

L1240214-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1240214-04 07/30/20 22:54 • (MS) R3555161-3 07/30/20 23:16 • (MSD) R3555161-4 07/30/20 23:37

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,4-Dichlorobenzene	0.500	ND	0.294	0.170	58.8	34.0	1	17.0-120		J3	53.4	40
2,4-Dinitrotoluene	0.500	ND	0.446	0.381	89.2	76.2	1	39.0-125			15.7	25
Hexachlorobenzene	0.500	ND	0.406	0.337	81.2	67.4	1	35.0-122			18.6	24
Hexachloro-1,3-butadiene	0.500	ND	0.297	0.181	59.4	36.2	1	12.0-120		J3	48.5	34
Hexachloroethane	0.500	ND	0.290	0.170	58.0	34.0	1	10.0-120		J3	52.2	40
Nitrobenzene	0.500	ND	0.290	0.169	58.0	33.8	1	12.0-120		J3	52.7	30
2-Methylphenol	0.500	ND	0.290	0.158	58.0	31.6	1	10.0-120		J3	58.9	30
3&4-Methyl Phenol	0.500	ND	0.306	0.177	61.2	35.4	1	10.0-120		J3	53.4	36
Pentachlorophenol	0.500	ND	0.360	0.327	72.0	65.4	1	10.0-128			9.61	37
2,4,5-Trichlorophenol	0.500	ND	0.422	0.300	84.4	60.0	1	33.0-120		J3	33.8	31
2,4,6-Trichlorophenol	0.500	ND	0.410	0.261	82.0	52.2	1	26.0-120		J3	44.4	31
Pyridine	0.500	ND	0.121	ND	24.2	13.4	1	10.0-120		J3	57.4	37
(S) 2-Fluorophenol					*38.6*	*19.1*		*10.0-120*				
(S) Phenol-d5					*25.4*	*12.5*		*10.0-120*				
(S) Nitrobenzene-d5					*52.7*	*28.7*		*10.0-127*				
(S) 2-Fluorobiphenyl					*73.9*	*45.5*		*10.0-130*				
(S) 2,4,6-Tribromophenol					*91.0*	*73.5*		*10.0-155*				
(S) p-Terphenyl-d14					*82.8*	*79.4*		*10.0-128*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P	RPD between the primary and confirmatory analysis exceeded 40%.

ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1,6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1,4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.

Alexandria Sewer Treatment Plant

Public Square
Alexandria, TN 37012

Billing Information:
Accounts Payable
Public Square
Alexandria, TN 37012

Pres Chk

Report to: Rich Potter

Email To: smithwaterplant@dtccom.net

Project Description:

City/State Collected:

Please Circle: PT MT CT ET

Phone: 615-683-5721

Client Project # sludge

Lab Project # ALEX02-ANNUAL SLUDGE

Collected by (print): RICH POTTER

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	FCLS Microbiological	TCLP Metals 1L-Clr-NoPres	TKN,NH3,NO3,NO2 4ozClr-NoPres	Total Solids,PCBs 4ozClr-NoPres
ANNUAL SLUDGE SLUDGE TEST FOR		SS		7-16-20	1100	2			X	X
ANNUAL SLUDGE		SS		↓	↓	1		X		
~~ANNUAL SLUDGE~~		SS		↓	↓	9	X			
PCBS										
TCLP										
7 FECALS										
TKN/NH3										
NITRATE/NITRITE										
TOTALSOLIDS										
3 METALS										

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # U240214
E183
T

Acctnum: ALEX02
Template: T62977
Prelogin: P781544
PM: 616 - Stacy Kennedy
PB: TB 6-22-20

Shipped Via: FedEX Ground

Remarks	Sample # (lab only)
	-01
	-02
	-03

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other

Remarks:

pH ___ Temp ___
Flow ___ Other ___

Samples returned via: ___ UPS ___ FedEx ___ Courier UH

Tracking # 1922 0799 9015

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
	7/16/20	11:58AM	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / (No) HCL / MeoH TBR

Temp: 10.9 +/- 1.0 °C Bottles Received: 12

Date: 7-16-20 Time: 1252

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

CLIENT: Alexandra Sewer ESC L# **L1240214-03**

DATE ON: **7/17/2020** DATE OFF: **7/18/2020**

Data entered into excel spreadsheet by: **BE**

Plate	ml filtered
A	0.001
B	0.0001
C	0.00001
D	0.000001

<---Largest Volumn Tested

**Enter data into areas that are in blue font.

sample type: Liquid

MPN/mL From Table 4 Method 1681

Sample No.	Combination of Positives			MPN/mL	Dilution	MPN Result	Log Values
1	0	0	0	< 0.1803	0.001	< 3279.61	3.51582204
2	0	0	0	< 0.1803	0.001	< 3276.32	3.5153866
3	0	0	0	< 0.1803	0.001	< 3336.40	3.52327849
4	0	0	0	< 0.1803	0.001	< 3263.27	3.51365254
5	0	0	0	< 0.1803	0.001	< 3263.80	3.51372327
6	0	0	0	< 0.1803	0.001	< 3281.85	3.51611926
7	0	0	0	< 0.1803	0.001	< 3268.01	3.51428289

3.51603787

GEO MEAN < **3281.24**

[FCMPN/g]= (MPN/1mL) from Table 4 / (Largest Vol tested) X (% total solids-expressed as a decimal)

% Total Solids (expressed as a decimal) = Dry wt - Initial wt / Wet wt - Initial wt

	Percent Solids			
Sample #	Initial Weight of Boat	Wet Weight	Dry weight	% Total Solids expressed as a decimal
1	1.25149	7.05165	1.57036	0.05498
2	1.2424	6.55811	1.53493	0.05503
3	1.2447	6.42769	1.52479	0.05404
4	1.25458	6.64268	1.55228	0.05525
5	1.2603	6.62665	1.55675	0.05524
6	1.24113	6.37178	1.523	0.05494
7	1.23612	6.69766	1.53744	0.05517

Class B Fecal Coliform Analysis by MPN- EPA 1681

[Liquid] or Solid]

Client Name: Alexandra Sauer

ESC Sample #: L1240214-03

Final pH must be between 7.0-7.5 and must not use more than 15mL of (HCl or NaOH) per 300mL.

	Set up 35 deg	Move to 44.5 deg	Test end info	1,000x (10mL per tube of 10,000x)	10,000x (10mL per tube of 100,000x)	100,000x (1mL per tube of 1,000,000x)	1,000,000x (0.1mL per tube of 10,000,000x)			
1	Date/Time: 7/17/20 @ 9:34	Date/Time: 7/18/20 @ 12:49	Date/Time: 7/18/20 @ 9:20	0	0	0	0	Initial pH	7.9	0.1 ml of 1N HCl
	Temp: 35	Temp: 44.5	Temp: 44.5					Final pH	7.2	
	Analyst: JSV	Analyst: JSV	Analyst: JSV					Method Blank	010	
	SAMPLE COLLECTION: 7/16/20 @ 11:00	Combination of Positive:	0-0-0e.001					Negative Con	0	
		MPN/mL from table:	<0.1803					Positive Con	X	
								MPN Result	<3,279.6	
2	Set up 35 deg	Move to 44.5 deg	Test end info	1,000x	10,000x	100,000x	1,000,000x	Initial pH	8.0	0.1 ml of 1N HCl
	Date/Time:	Date/Time:	Date/Time:	0	0	0	0	Final pH	7.3	
	Temp:	Temp:	Temp:					Method Blank	010	
	Analyst:	Analyst:	Analyst:					Negative Con	0	
	SAMPLE COLLECTION:	Combination of Positive:	0-0-0e.001					Positive Con	X	
		MPN/mL from table:	<0.1803					MPN Result	<3,276.3	
3	Set up 35 deg	Move to 44.5 deg	Test end info	1,000x	10,000x	100,000x	1,000,000x	Initial pH	7.9	0.1 ml of 1N HCl
	Date/Time:	Date/Time:	Date/Time:	0	0	0	0	Final pH	7.4	
	Temp:	Temp:	Temp:					Method Blank	010	
	Analyst:	Analyst:	Analyst:					Negative Con	0	
	SAMPLE COLLECTION:	Combination of Positive:	0-0-0e.001					Positive Con	X	JSV 7-17-20
		MPN/mL from table:	<0.1803					MPN Result	~~7.9~~ <3,336.4	
4	Set up 35 deg	Move to 44.5 deg	Test end info	1,000x	10,000x	100,000x	1,000,000x	Initial pH	7.9	0.1 ml of 1N HCl
	Date/Time:	Date/Time:	Date/Time:	0	0	0	0	Final pH	7.3	
	Temp:	Temp:	Temp:					Method Blank	010	
	Analyst:	Analyst:	Analyst:					Negative Con	0	
	SAMPLE COLLECTION:	Combination of Positive:	0-0-0e.001					Positive Con	X	
		MPN/mL from table:	<0.1803					MPN Result	<3,263.3	
5	Set up 35 deg	Move to 44.5 deg	Test end info	1,000x	10,000x	100,000x	1,000,000x	Initial pH	8.0	0.1 ml of 1N HCl
	Date/Time:	Date/Time:	Date/Time:	0	0	0	0	Final pH	7.3	
	Temp:	Temp:	Temp:					Method Blank	010	
	Analyst:	Analyst:	Analyst:					Negative Con	0	
	SAMPLE COLLECTION:	Combination of Positive:	0-0-0e.001					Positive Con	X	
		MPN/mL from table:	<0.1803					MPN Result	<3,263.8	
6	Set up 35 deg	Move to 44.5 deg	Test end info	1,000x	10,000x	100,000x	1,000,000x	Initial pH	7.9	0.1 ml of 1N HCl
	Date/Time:	Date/Time:	Date/Time:	0	0	0	0	Final pH	7.3	
	Temp:	Temp:	Temp:					Method Blank	010	
	Analyst:	Analyst:	Analyst:					Negative Con	0	
	SAMPLE COLLECTION:	Combination of Positive:	0-0-0e.001					Positive Con	X	
		MPN/mL from table:	<0.1803					MPN Result	<3,281.9	
7	Set up 35 deg	Move to 44.5 deg	Test end info	1,000x	10,000x	100,000x	1,000,000x	Initial pH	8.0	0.1 ml of 1N HCl
	Date/Time:	Date/Time:	Date/Time:	0	0	0	0	Final pH	7.3	
	Temp:	Temp:	Temp:					Method Blank	010	
	Analyst:	Analyst: JSV	Analyst:					Negative Con	0	
	SAMPLE COLLECTION:	Combination of Positive:	0-0-0e.001					Positive Con	X	
		MPN/mL from table:	<0.1803					MPN Result	<3,268.0	

denotes Positive tube

denotes Negative tube

(30g +/-.1g)

Total Solids Analysis

Sample	Dish Label	Initial wt (g)	Wet wt (g)	Dry wt (g)	%Tot Solids	Amt used (g)
Sample #1	Alx -1	1.25149	7.05165	1.57036	0.05498	
Sample #2	Alx -2	1.24240	6.55581	1.53193	0.05503	N
Sample #3	Alx -3	1.24470	6.42769	1.52479	0.05404	
Sample #4	Alx-4	1.25458	6.64268	1.55228	0.05525	A
Sample #5	Alx-5	1.26030	6.62665	1.55675	0.05524	
Sample #6	Alx-6	1.24113	6.37178	1.52300	0.05494	
Sample #7	Alx-7	1.23612	6.69766	1.53744	0.05517	

Media/Reagents Lot #	Lot:	Exp date
A1 medium Lot #:	ESC 44140	3/31/2021
Phosphate Buffer:	ESC 43851	10/31/2021
NaOH Lot:	NA	NA
HCl Lot:	42277	4/2/2021
Positive Control: E. coli	071620	7/17/20
Negative Control: E.aerogenes	062520	09/25/20
^(only need for OPR or MS)		
^TSA Slant Lot #:	N/A	N/A
^1% LTB Lot #:		

Alexandria WWTP
Volatile Solids Reduction

11/24/2020

1		2
WASTE (INTO Dig)		Digesters
1.4084	Initial	1.4146
1.4488	Final	1.5115
0.0404		0.0969
8,080 TSS		19,380 TSS
1.4488	In Furnace	1.5115
-1.4199	Out Furnace	-1.4535
0.0289		0.0580
5,780 VS		11,600 VS
= 71.5% VSS		= 59.9% VSS

$$\frac{71.5 - 59.9}{71.5 - (71.5 \times 59.9)} \times 100 = \frac{.715 - .599}{.715 - (.715 \times .599)} \times 100$$

$$\frac{0.116}{.287} \times 100 = 40.4\% \text{ VS Reduction}$$


Land Application Site
Write a description for your map.
1
Legend
36.289980 -86.025332
36.289980 -86.025332
Lock 7 Ln
Jack Hackett Rd
N
2000 ft
Google Earth
© 2021 Google


Land Application Site 2
Write a description for your map.
Legend
36.293623 -86.002278
25
36.293623 -86.002278
Google Earth
© 2021 Google
N
1000 ft